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VETERINARY MEDICINE

DECEMBER 1938

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So far as is known, all filterable viruses are obligate parasites.

* * * *

Anaplasmosis of cattle is characterized by high fever, rapid loss of flesh, severe anemia and almost total suppression of milk production in lactating animals.

* * * *

The traffic in domestic animals in the United States is so enormous that any disease of animals existing anywhere in the country is of interest to every other part.

* * * *

The veterinary profession can well continue to acquaint the public with the advantages of reliable live stock remedies and warn it against worthless remedies.—*Mohler.*

* * * *

Carbohydrates constitute about three-quarters of all the dry matter of plants. Their source is chiefly the grains and the crude fiber. The latter are not highly digestible.

* * * *

The increase of follicular mange in cattle is appalling to the leather industry and costly too. Unless controlled, it will make the cattle industry unprofitable at market price levels that have heretofore been profitable. Ringworm too is spreading rapidly to the dismay of the leather industry.

Most young grasses are a good source of proteins.

* * * *

A hog will fatten on corn alone; but it will fatten in less time and on less than half the feed if given a supplementary protein.

* * * *

It is extremely difficult to inoculate a hog with organisms of swine erysipelas, but naturally, the disease spreads easily.

* * * *

The diagnosis of erysipelas in a herd of swine in which cholera is present, is extremely difficult. Unlike hog cholera, the behavior of swine erysipelas is not uniform.

* * * *

When a large trocar is inserted into the rumen of an ox the canula should not be removed for 36 hours. This gives time for adhesions and prevents leakage from the rumen to the peritoneal cavity, with resultant abscesses.

* * * *

Erysipelas organisms have long been known to occur in swine in this country, but no acute cases were diagnosed until about 1929. Since that time, erysipelas has been one of the important diseases of swine in the Missouri Valley territory. It appears that it will be a perennial problem in the corn belt.

Cereal grains run 3 to 4% fat. Soy beans and peanuts run 20 to 25% fat.

Sweet clover (and alfalfa too) grown on poor land is more prone to cause bloat in cattle than when grown on good land.

The U. S. Department of Agriculture reports that *Tephrosia* (devil's shoestring, rabbit's bean, turkey pea, goat's rue) contains rotenone in commercial quantities and can probably be used instead of derris and cube roots, now imported from the East Indies and tropical America.

There will be no important live mink shows held this fall. The reason—distemper. Exhibitors suffered epizoötics last year following the shows and are afraid. Several mink ranchers have discontinued the practice of having auction company graders go through their herds, because of the distemper hazard.

The Council on Pharmacy and Chemistry of the American Medical Association has given years of study and struggle to the work of establishing and guarding the standards of purity in drugs, which is essential to good medical care.—*Hygeia,* 16:5.

Of every 100 chickens autopsied at the Laboratory of Animal Pathology and Hygiene, University of Illinois, 30 are found infested with parasites, 28 infected with bacterial diseases, 21 suffering from protozoan disturbances, 18 from filterable viruses and three from nutritional disease. This record was compiled from the examination of 11,000 specimens.

Recent medical literature indicates that the dimethyl carbamic ester of 3-hydroxyphenyl-trimethylammonium methylsulfate (trade name "prostigmin," Hoffman-La-Roche) may have a use in veterinary medicine. In human medicine, used according to the indications for eserine, it is regarded as far superior to the older product in certainty of action, safety and freedom from undesirable results such as pain, cardiac depression, etc.

Although mature chickens can be infected with tuberculosis, they do not get it from contact with diseased birds except in negligible numbers. The old bird is the source of tuberculosis infection—the young bird gets it.—*Van Es.*

In the control of poultry diseases, keeping mature stock separate from young stock is sound practice. In general the old stock is the purveyor of infection—the young stock is the recipient of it.—*Van Es.*

Even after removing the infected birds from a tuberculosis flock, the great bulk of infection remains. It lives in the soil for many years.—*Van Es.*

Reasonable sanitation gives remarkable results in the control of blackhead in turkeys. Just keeping fecal contamination out of the feed and water controls blackhead completely. This same measure, the separation of fecal matter from feed and water, will completely control coccidiosis in chickens, if carried on to completion.—*Van Es.*

Arsenic

Arsenic, an active systemic poison and topically a powerful corrosive agent, has long been considered an ideal, harmless, yet effective tonic by the animal husbandman. One of those magic drugs which, if a little will do some good, more will be a big help; one which can be given to a healthy animal to bring its health way above 100%.

About a decade ago, it was shown that prolonged drugging with arsenic reduces or destroys the fertility of animals and inferentially that the notoriously poor breeding records of blue ribbon winners in the show ring is due, not to the fattening incident to showing, but to chronic arsenical poisoning—not to high feeding, as has been supposed, but to high drugging.

Recently Major C. M. Stewart, R. A. V. C., as a result of an investigation of anhidrosis—"dry coat, non-sweating"—in race horses, reached the conclusion that this condition, too, is due to chronic poisoning by this same harmless tonic.

Red Cross History One of Service

Bugles are blowing, drums are rolling, banners snapping in the early morning breeze. It is June 24, 1859. The plains of Lombardy are alive with moving masses of men. French and Italians, 150,000 strong, are aligned against 170,000 Austrians.

By nightfall the Austrians are in retreat. The green, flowing fields have given way to chaos. Fifty thousand men lie dead or wounded and the battle of Solferino has become history.

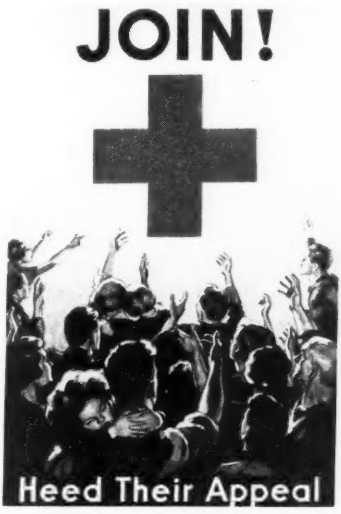
All that day Henri Dunant, a young Swiss traveler, watched the carnage from a hillside. He realized the inadequacy of the treatment that might be meted out to these men who, 24 hours before, had been in the flower of manhood, but now lay helpless, close to the door of death. And he realized that something could be done to help them.

Going into the village of Castiglione, he organized the women into volunteer bands. He persuaded them to help friend and foe alike. Shortly all available space in the village was occupied by wounded. Other villages did likewise and soon everything that the limited facilities made possible had been done.

Under such conditions was born the idea of the Red Cross, composed of groups prepared to administer to, and ease the sufferings of, the men of either side in time of war. But Dunant did not stop with the idea. His time, thenceforward, was devoted to having it adopted. Some leaders and governments were skeptical, some approved.

In 1863 his efforts bore fruit and an international conference was held at Geneva. From this came the establishment of the Red Cross. In honor of the man who had devoted his time to creation of the organization, the Swiss flag, a white cross on a red background, was reversed and designated as the international symbol of the newly-created armies of mercy.

Within five years 33 nations had organized Red Cross societies and were registered with the international committee at Geneva. It was not until 1882, however, that the United States government proclaimed its adherence to the convention. The year previous Clara Barton's had resulted in the American Association of the Red Cross. The organization had already received its baptism, literally under fire, when it brought relief to the victims of forest fires that swept portions of the state of Michigan in the summer of 1881. Today every civilized country boasts a Red Cross society or its equivalent.



The Red Cross is ever ready to serve when need arises. In conducting its rescue and relief activities, it does not always confine its services to human beings. Caring for pets and animals is one of the relief tasks of the Red Cross in time of disaster.

Disaster relief activities of the Red Cross, whether for animals or human beings, are supported from membership dues, voluntary contributions and gifts. The larger the Red Cross membership the more effective will be its services. The annual Roll Call, at which time everyone is invited to join one of the 3,712 chapters that are located throughout the United States, begins Armistice Day and ends Thanksgiving.

Association of Grasses and Legumes

There is ample evidence to indicate that legumes have a direct beneficial effect on the growth of grasses associated with them.

At Ottawa, mixtures of grasses and legumes have consistently outyielded pure species. The yield of pasture herbage from ten cultivated grasses grown separately for a period of three years varied from 1,077 to 2,415 pounds moisture-free herbage per acre, with an average production of 1,953 pounds, whereas the yield of ten grass-legume mixtures in the same test varied from 4,016 to 5,712 pounds, with an average production of 4,924 pounds per acre. The legumes consisted of lucerne, red clover and alsike. In all cases the yields of these legumes grown alone were appreciably less than those of the mixtures.—*L. E. Kirk,* Central Experimental Farm, Ottawa, Canada.

Inoculated legumes bearing abundant nodules on their roots secrete nitrogen from the air, some of which is used for the legume itself and some excreted from the nodules into the soil, where it enhances the growth of associated non-leguminous plants. This does not occur till nodules are formed. Legumes should be inoculated.—*A. I. Virtanen,* Finland.

Pasture grass kept short by efficient grazing or systematic cutting contains a very high percentage of protein throughout the whole season. Grass in its young and leafy stage of growth, possesses a far higher nutritive value than has heretofore been suspected. It contains about 20% of protein (more than twice as much as the grain of corn, oats or barley) and is high in vitamins and available minerals. Grass in young, leafy pasturage stage is essentially a feed designed for production. If grazed closely or mowed at monthly intervals, any variety of grass is high in feeding value.—*H. E. Woodman,* Cambridge, England.

Grass or legumes representing the same period of growth, when cut monthly, were quite similar regardless of genera, family, or fertilization. That is, rye grass or oats, had about the same protein content and analysis as white clover, when cut in the same immature stage of 30 days' growth. —*R. H. Lush,* La. Exp. Sta.

Sow a mixture of wheat, oats and barley in March for use as pasture in June and July. Heavy seeding, 5 or 6 bushels per acre, broadcast or drilled and cross drilled —gives a thick stand, firm turf, and increased feed. Turn on it as soon as it is two inches high, and try to graze it so heavily that it never gets eight inches high. The grass from grain in such early stages, has the same feeding value as regular grasses or clovers cut or grazed at the same stage of growth.

Sow sudan grass in May, for late July and August pasture. This, like the foregoing, should be grazed by horses as soon as it is two inches high and grazed so heavily that it never gets eight inches high. Five animals per acre will usually keep it grazed down. If they graze it too short, the horses can be turned on other pastures for a few days.

Pasture is the cheapest and best of all feeds for horses and mules of all ages. It should be so utilized as to provide a succession of fast growing, immature green pastures from April to December, and longer if climate permits; but such green pastures should always be supplemented with some dry feed, as it is too "washy" when grazed alone. Oat straw or oat hay serves excellently to balance such green pastures, and should be where animals can have access to it as they wish.

Grain pastures and sudan grass, sown at intervals, will afford abundant green feed during dry summer months and young animals will make more rapid as well as cheaper growth where it is made available to them.—*Wayne Dinsmore.*

Veterinary History

The history of the veterinary profession is old. We in the United States speak of veterinary medicine as a rather new science and art, when as a matter of fact, it is the oldest of human endeavors and is probably one of the most important. The veterinary profession likes to think of itself as being more important than the medical profession. We like ourselves pretty well. But, fundamentally, mankind lives upon animals. There could be no such thing as a civilization without domestic animals.

Man is only as well off (and that goes for nations too) as his domesticated animals. The better they are, the more attention they receive, the more wealthy and stronger the nation becomes.

President Leclainche of the 13th International Veterinary Congress in Zurich, Switzerland, stated just a few weeks ago that the founding of veterinary schools came about because of a cattle disease called bovine pest. We generally speak of it as rinderpest. It was the ravages of that disease on the food supply of civilized countries succeeding the Middle Ages that turned minds toward the creation of some type of orderly, formal, systematic attention to animals such as was already being done for human beings; so veterinary schools and veterinary services were established. I wish that all veterinarians would get into their minds that it was the development of our art by establishing veterinary schools and systematic veterinary service in the nations of Europe that started the civilization in which we live. Before then the fate of man, the fate of populations and the fate of nations was always precarious, because of the uncertainty of the food supply due to ravages of disease among animals. But man finally began to realize that he should take care of his animals. Then and not till then were nations able to develop what we have today in the way of healthy and wealthy populations.

Veterinary education, Prof. Leclainche said, in the same address at Zurich, was started by governments; but it was associations that set the standard: the raised entrance requirements, the improved curriculum and the more scientific utilization of our science. It was through the foresight of the associations and the cooperation of the graduates of the schools that the veterinary profession developed.

In the United States, unfortunately, we did not have veterinary associations until a very late date. The national organization was organized in 1863; but it was a pretty local affair for many years. It was not until the end of the nineteenth century that its influence extended across the Alleghanies, but since that time its scope has become national. And what about the state associations? In the nineteenth century and the first decade of the twentieth century, the state veterinary convention that drew an audience of 20 was called a bumper meeting. So you see, our associations are very young as going organizations; their anemic adolescence doesn't count. It is through them, through their foresight, through their vision, that advancement came about. The veterinary profession takes pride in claiming that it has followed closely the progress of its brother professions. When I went to school, a friend of mine started for medical college at the same time; he beat me home two weeks with his diploma and I was gone only two years. Veterinary medicine at that time was about on an equal footing with human medicine. Ever since it has followed so well the examples of the medical profession in increasing its requirements that today we have good literature, good schools, a good working profession. Our numbers are probably not sufficient, but we are going along, and what this country of ours possesses in wealth it owes in a large measure to what veterinarians have done in protecting the food and clothing supply of our people, making their investment in live stock secure and making farming a profitable business, something it would not be but for their work.—*L. A. Merillat,* from an address at the banquet at the 25th Annual Meeting of the Eastern Iowa Veterinary Association, Oct. 18, 1938.

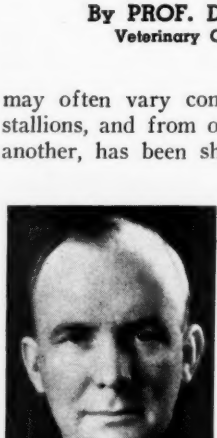
Infertility in Male Domestic Animals*

By PROF. DR. NILS LAGERLOF,
Veterinary College, Stockholm, Sweden

AS IN the breeding of domestic animals the male as a rule has to serve a very large number of females every year, reduced fertility or sterility in the male often entails serious losses. Infertility in stallions causes, as a rule, a fairly large number of mares to lose a whole year from a reproductive point of view. Infertility in the bull entails a considerable dislocation of the calving period of the cows, and this jeopardizes the breeding economy to a high degree. Even in the case of sheep, goats, and pigs infertility in the male plays a certain rôle. Of by far the greatest importance seems, however, to be sterility in the bull.

Cases of incapacity to copulate have been observed, and incapacity to fertilize caused by palpable changes in the sexual organs. On the other hand, disturbances in the spermiogenesis, without distinctly noticeable clinical symptoms, have often been overlooked or ignored. W. L. Williams pointed out, as early as 1921, that very likely just as large a percentage of bulls as of cows have to be discarded on account of sterility, and Lagerlöf published in 1934 an inquiry into the cause of discarding in about 2300 bulls in Swedish bull societies, in which he found that 23 to 24% had to be discarded from breeding on account of infertility in one form or another. Richter (1938) estimates, in so far as central Germany is concerned, that the frequency of sterility in bulls very likely amounts to approximately 20% of the frequency amongst the cows. These conditions may of course differ very much in different countries and in different breeding areas. The smaller the breeding area, the more intense as a rule becomes in-breeding, which undoubtedly increases those forms of sterility which are connected with hormonal disturbances.

The low percentage of fertility which is occasionally met with in some horse breeding districts is certainly due to reduced fertility in the stallion. The fact that fertility may often vary considerably in different stallions, and from one breeding season to another, has been shown by Sanders and Nielsen. On the other hand, cases of absolute sterility in stallions are seldom recorded in the literature. As regards Sweden, the observations I have been able to make show that sterility (impotentia generandi) has of late years increased in thoroughbred and Ardennes breeding, but seems to be practically unknown in the breeding of North Swedish horses.



Professor Dr. Nils Lagerlöf, born 1895, veterinarian at the Veterinary College of Stockholm 1919, assistant professor 1922 and professor in obstetrics and bujatric cattle diseases 1934. Lagerlöf visited the United States in 1930 and spent some time at the New York State Veterinary College. His work has been largely with the problems of low fertility and sterility in domestic animals; a subject on which he has published several papers

In goat breeding, sterility in the males has been noticed on a large scale by Richter, Götze, Wester, and others in Germany and Holland.

In the matter of sheep Quinlan, Maré, and Roux (1933) have shown that in South Africa a large percentage of clinically normal rams with normal libido have low fertility or are entirely sterile. In Europe, to judge from the literature, infertility in rams appears to be comparatively rare.

In swine breeding, infertility in boars appears to be relatively little known. Nevertheless, the author has observed in Sweden about 20 cases of infertility in boars, and the condition seems to be on the increase; this is probably connected with in-and-in-breeding, which is ever increasing.

*Presented at the XIII International Veterinary Congress, Zurich, Switzerland, Aug. 25, 1938.

Various Forms of Infertility in Male Animals

We are able to distinguish three forms of infertility in the male:

1. Entire absence of sexual desire (frigidity).

2. Incapacity to copulate (impotentia coeundi).

3. Incapacity to fertilize (impotentia generandi).

As regards the first two forms, these are so obvious that they are without difficulty discovered even by the layman. Several causes of impotentia coeundi, such as painful processes in the extremities, in the copulation-organs, or in the peritoneum, have been well known since the days of old, and I shall not deal in detail with these. Forssell, Götze, Hofmann, and others have in cases of impotentia coeundi carried out resection of the retractor penis muscle, in some instances with apparently good results. It seems to be doubtful, however, whether the fundamental cause should be looked for in the dysfunction of the retractor penis muscle. It seems to be more feasible and obvious that the cause lies in deficient erection of the penis as the result of hormonal disturbances, probably due to heredity. Of great interest are the researches carried out by Forssell, who has demonstrated that inflammation in the ileosacral joint is a comparatively common cause of impotentia coeundi in bulls, especially in young bulls. It is possible that this condition may have a certain relation to conditions of breeding or feeding. Nutritious feed and rapid growth very likely produce a relatively weak skeleton. The ileosacral joint may under such circumstances be unable to stand the strain to which it is subjected when the young bulls in the rest-yard are riding one another, or when a young bull at the age of 18 months is put into hard service.

Incapacity to Fertilize (Impotentia Generandi)

This form of infertility is characterized by reduced or ceased capacity of fertilization, though the male performs the act of copulation in a normal manner. Such a male may do a vast amount of damage, since often many months pass before the fault is discovered and the animal removed from breeding. This, of course, holds true particularly in those cases where the male is not altogether sterile, but has a low percentage of fertility. But even in cases where the male is altogether sterile, *e. g.*, in pronounced cases of testicular hypoplasia, it is not uncommon for a male to serve for a long time, and to cover a large number of females, before it is discovered that he is sterile.

Impotentia generandi is caused by morbid changes or functional disturbances in the testicles, epididymus, seminal ducts, or the accessory sexual glands. The pathology of the testicles in male domestic animals has not been sufficiently investigated heretofore. As a rule attention has been devoted to the graver, more palpable changes in the sexual organs, while minor degenerative changes in the seminal epithelium have been altogether overlooked, although these often entail sterility. This may to some extent be due to the circumstance that as a rule in pathological-anatomical examinations formol has been used as a fixative, and this is the worst imaginable for fixing testicular tissue.

Morbid changes in the testicles as a cause of reduced fertility or sterility in bulls has of late years been thoroughly studied by the writer, who in the course of these researches has examined especially to what degree disturbances in the spermiogenesis can be read from the semen picture. The ensuing account of impotentia generandi is based firstly upon investigations previously published (1934), and secondly upon later researches. Altogether examination of the gonads of about 1000 male animals has been made. In this material, greatly reduced or wholly ceased fertility has been demonstrated in 263 bulls, 32 stallions, 18 boars, and 6 dogs. (These 1000 animals do not include 95 cases of bulls in which testicular hypoplasia was proved in connection with an examination of this malformation in the Swedish highland breed.)

Material for histological examination was fixed as soon as possible after slaughter according to the Bouin method modified by

Allen. The specimens were after fixation treated according to the Péterfis methyl-benzoat-celloïdine method, and embedded in paraffin wax. In making a semen examination the spermatozoa were counted according to current methods, fixed according to the opal-blue method, and stained according to the W. W. Williams' method.

Through these examinations it has been ascertained that the commonest changes in the testicles, which give rise to disturbances in the spermiogenesis are:

1. Testicular hypoplasia, about 23%.
2. Degenerative changes in the seminal epithelium, about 41%.
3. Fibrosis testis, about 12%.
4. Inflammatory testicular changes, about 24%.

(Cases of testicular hypoplasia in the highland breed have not been included.)

It is seen from this summary that degenerative testicular atrophy and fibrosis testis together constitute more than half the cases, while the inflammatory changes are hardly one-fourth.

Testicular Hypoplasia

In bulls one finds different degrees of underdevelopment of the testicles, which in ordinary cases involves both testicles. Testicular hypoplasia seems to be of an hereditable nature, and is met with often in pure-bred young bulls destined for breeding. Since in the majority of cattle-breeds this malformation occurs in a dual form, and since the bulls in the majority of cases are altogether sterile, they are automatically discarded from breeding. Such bulls have a highly-developed sexual desire, and on an exterior examination of the sexual organs, only a trained and experienced observer is able to note that the testicles are smaller than normal.

In the Swedish highland breed (polled white cattle in the north of Sweden) there occurs a special type of this testicular hypoplasia; a one-sided hypoplasia of the sexual glands, both in males and females. As a rule the left sexual gland is hypoplastic, while the right one functions, and the animals therefore are, in most cases, fertile. The malformation has, however, a tendency to occur more and more in a dual form, thus causing sterility. In the males, this takes the form of dual testicular hypoplasia, with well-developed sexual desire; in the females, hypoplasia of the entire sexual organism and the udder, but chiefly of the ovaries. The heifers assume a more or less castrated type, and do not come in heat at all. Thorough investigation into this form of hypoplasia has of late years, been carried out by the author in collaboration with Professor Eriksson of the veterinary college in Stockholm. In the course of these investigations, about 2100 male and female animals in the most valuable herds of the breed have been examined. Of these animals approximately 30% were suffering from hypoplasia of the sexual organs; 25% had the left sexual gland undeveloped; 1% suffered from right-side hypoplasia, and in 4 to 5% the hypoplasia embraced both sexual glands. The investigation has proved that hypoplasia is of hereditary nature.

In bulls one finds different degrees of testicular hypoplasia: (1) cases with completely hypoplastic testicles, where no spermiogenesis occurs; (2) cases where some of the seminal ducts are undeveloped, but spermiogenesis takes place in other ducts. In such cases one can speak of partial hypoplasia. In regard to the semen picture and testicular changes, the cases of testicular hypoplasia can be divided into three groups.

Group 1.—The bull is completely sterile. Sexual desire is particularly lively. The semen is almost as clear as water, and altogether deficient in spermatozoa, with more or less giant cells in the ejaculate. The sexual organs appear to be normally developed, with the exception of the testicles, which are strikingly small, and of a fairly firm consistency. A microscopic examination of the testicles shows that in all the seminal ducts there is only one cell-layer, consisting of undeveloped testicular cells (strongly reminiscent of Sertoli cells) on the membrana propria, which is of normal thickness. The ducts of the epididymes are empty.

Group 2.—The bull is either sterile or infrequently fertile. The semen picture shows a low number of spermatozoa and also giant cells. The motility of the spermatozoa is not high, a large percentage of them having undergone a pathological change or remained unripe. The testicles are slightly smaller and firmer than normally. A microscopic examination shows that one-half to two-thirds of the seminal ducts remain in a completely undeveloped stage. In some cases formation of giant cells has occurred, which suggests that the seminal epithelium has tried to develop into full spermiogenesis, but that an arresting moment has counteracted this development, whereby the epithelium has undergone degeneration and giant cells have formed.

Group 3.—This group includes young bulls which, when put to breeding, also prove to be practically sterile. The semen picture shows a trifling number of spermatozoa, as a rule between 50,000 and 150,000 or fewer per cubic millimeter; the motility of the spermatozoa is reduced; the percentage of pathological spermatozoa and of unripe spermatozoa is large. The testicles appear to be of approximately normal size. The microscopic examination shows that only a comparatively small part of the seminal ducts remain in an undeveloped stage. The preponderant number of ducts has a multiple layer of seminal epithelium, and the spermiogenesis is here proceeding, although not in such a lively manner as normally. In several instances one encounters dropsical degeneration of spermiocytes and the formation of large vacuoles in the spermiocytic layer; and in the spermiodic layer the formation of giant cells is often met with.

In my opinion one should be entitled to consider a testicle in a young sexually-ripe male animal as hypoplastic or undeveloped even though the histological examination does not disclose any wholly-undeveloped seminal ducts, if it is found that the seminal epithelium has difficulty in differentiation, so that normal spermiogenesis cannot take place. This should, however, hold good only on condition that the breeding history and the result of sperm examinations made at certain intervals lend support to such an assumption.

In the earlier literature only a relatively insignificant number of cases of testicular hypoplasia in domestic animals has been described.

Degenerative Testicular Atrophy

Degenerative processes in the testicle with atrophy of the seminal epithelium constitute in all probability the most common cause of reduced fertility or of sterility in the male domestic animals. Degenerative testicular atrophy is characterized by the fact that the differentiated seminal epithelium of a greater or lesser part of the testicle becomes subject to necrobiotic changes, by which the epithelial layer of the seminal ducts is reduced. This reduction can go so far that only a layer of cells—Sertoli's cells—remains, and in some cases the seminal ducts may be altogether destroyed.

The causes of degenerative testicular atrophy are of an extremely varying nature, and I would in this respect refer to Schinz and Slotopolsky's exhaustive account of hypobiotic changes in the testicles. Hardly any other member of the organism seems capable of reacting so rapidly to all possible external and internal influences as do the testicles. Sundry irritants produce, on the whole, changes similar from a qualitative point of view, but the degree of the changes varies. Even although in some cases one is able to demonstrate the cause, or the probable cause of degenerative testicular atrophy, such as fever, chronic general suffering, intoxication of an endogenous or exogenous nature, mental influence, disturbances in nutrition, conditions of inanition, etc., it seems that in the majority of cases of degenerative testicular atrophy the cause cannot be determined with any certainty. In all probability hormonal disturbances occur as the cause in male animals. Since dispositions for disturbances in the inner secretion very likely may be hereditary, we seem to be entitled to assume that some domestic male animals, through inherited disposition, may be more subject

than others to disturbances in their hormones, which also affect the sexual functions. The rôle of vitamin deficiency as a causative agent of such disturbances in male domestic animals does not seem to have been elucidated as yet, although it appears that this would constitute a fruitful field for investigation.

There is a general rule that the most differentiated seminal epithelium, i.e. the spermides, is first attacked. Since in some cases the cell injuries are relatively slight, and the degenerative process may proceed very slowly, one may find in one and the same testicle varying pictures of degeneration. I have in bulls in many instances found that the newly-developed spermiocytes constitute the most sensitive cellular element. A hydropic degeneration of the spermiocytic layer with wholly or partially intact spermide layer, constitutes often the most important degenerative symptom in this animal.

In the case of minor injury to the seminal epithelium, spermatozoa are often still being formed to a normal number, but the spermatozoa developed are to a greater or less extent pathologically changed. Even with an apparently relatively slight change of the seminal epithelium the capacity for fertilization in the spermatozoa may be considerably reduced. In the case of advanced degeneration in the seminal epithelium the number of spermatozoa developed diminishes to a marked degree. The spermatozoa formed are then generally to a large extent pathologically changed. The degenerative testicular atrophy, in so far as I have found, apparently need not affect detrimentally the males' ability to copulate.

In degenerative testicular atrophy one is able with the guidance of the semen picture and the testicular changes to make a graduation of the cases into three degrees of departure from the normal.

Degree 1.—Bulls with considerably reduced fertility. There are no clinically demonstrable changes in the sexual organs. A spermatic examination shows as a rule a normal number of spermatozoa, that mostly display high motility. On the other hand, the number of pathologically-changed spermatozoa is considerably greater than normally. A histological examination shows degenerative changes in the spermide layer, occasionally also in the spermiocytic layer. As in these cases repeated examinations of spermatic samples from a certain male disclose considerable changes in the shape of the spermatic heads, but only comparatively slight changes in the seminal epithelium, it seems obvious that functional disturbance which causes the occurrence of large numbers of degenerate spermatozoa may exist in apparently intact seminal epithelium. It is generally stated that the first characteristic of degeneration of the seminal epithelium, is that the spermides lose their capacity to form spermatozoa. Such is not the case. The occurrence of pathologically-changed spermatozoa is the first symptom of degenerative changes in the seminal epithelium.

Degree 2.—Bulls of low fertility or wholly sterile. The sexual organs appear normal upon clinical examination. The semen picture shows a comparatively plentiful number of spermatozoa, yet a lower number than normally. The motility of the spermatozoa varies somewhat; in some cases normal, in others reduced. Through histological examination one finds prominent, degenerative changes in the seminal epithelium. Most striking as a rule is the dropsical degeneration in the spermiocytic layer.

Degree 3.—Totally sterile bulls. When making a clinical examination of the sexual organs somewhat small testicles are often found. An investigation of the sperm shows a low number of spermatozoa, or approximately 300,000 to 400,000 or fewer per cubic millimeter. The spermatozoa's motility is often low, and the number of pathological spermatozoa is high, about 35 to 40%. A histological examination of the testicles shows extensive degenerative changes in the seminal epithelium, from low-grade desquamation in the spermide layer to complete destruction of the seminal or sperm-ducts, and commencing transition to fibrosis testis. The formation of giant cells is often found in some seminal ducts.

Fibrosis Testis

Fibrosis testis constitutes the final stage of general atrophy of the seminal epithelium. It involves a complete destruction of the seminal or sperm-ducts together with induration of connective tissue in the interstitium. Animals in which wide-spread fibrosis testis is demonstrated on sectioning have generally been sterile for quite a long time. If extensive fibrosis exists, the testicles on being clinically examined feel harder than normally. The incised surface is dry and yellowish-brown to dark-brown, and often shows numerous streaks of nuclei. The epididymes are small and without any content. Testicular fibrosis is relatively common in domestic animals, chiefly in bulls.

Degeneration of the Seminal Epithelium Produced Experimentally

In order to study the way in which the semen deteriorates with commencing testicular atrophy, and also the way in which the semen picture is changed in regeneration of the seminal epithelium, it is advisable to produce degenerative testicular atrophy by experimental methods. An ideal method for such tests on ruminants with pendant testicles, is to place a heat-insulating cover on the scrotum. Through this the heat-regulating capacity of the scrotum is put out of operation, and as a result there occur, in a very short time, degenerative changes in the seminal epithelium. Such experiments have been carried out by Lagerlöf on bulls, and by Phillips and McKenzie on rams. The investigation with bulls have shown that the heat-insulation of the scrotum, which lasts 4 to 5 days, does not entail any material diminution of the number of spermatozoa, but does entail a considerable increase in the number of pathological spermatozoa, which may be noted first of all by the tapering of the posterior part of the head —piriform head. The semen picture here greatly resembles that which one finds in some cases of sterility. Even with this comparatively slight influence on the testicles, the motility of the spermatozoa is as a rule reduced, possibly due to the fact that the epididymes also are subjected to a rise in temperature. In such mild cases of degeneration the seminal epithelium appears capable of being regenerated relatively rapidly, after the injury which has caused degeneration has been removed, for after a period of four to six weeks the semen picture is, as a rule, again normal. In the case of a more prolonged disturbance (11 to 16 days) in the heat-regulating function of the scrotum, there occur in the semen picture very considerable changes, the number of spermatozoa rapidly decreasing and the preponderant number of spermatozoa developed becoming pathologically changed. The spermiogenesis ceases altogether comparatively quickly, and during a period of about four months practically no spermatozoa are developed. After that a regeneration of the seminal epithelium commences, and this is completed in about three months. A histological examination of testicles removed during the test-periods showed that the changes in the semen picture were in direct ratio to the degree of the changes in the seminal epithelium.

The experiments here related have *inter alia* shown that degeneration of the seminal epithelium can proceed very rapidly, and also, if the degenerative process has not gone too far, a regeneration can be accomplished in a relatively brief period. If the injury is of a graver nature, the spermiogenesis may be arrested for several months, and regeneration not be accomplished until after seven to eight months. The chief condition for regeneration is, of course, that the injury which has caused the degenerative changes in the seminal epithelium no longer acts. Another condition for regeneration is that the degeneration of the seminal epithelium has not reached the Sertoli cells. The general rule, therefore, is that regeneration takes essentially longer than degeneration. If the degenerative process is accomplished in one or more weeks, regeneration as a rule occupies a corresponding number of months. These observations show that there is a very good prospect for relatively rapid changes in the fertility of a male animal; a matter that should not be lost sight of when the validity of the certification of fertility is questioned.

Inflammatory Testicular Changes

From the preceding remarks it should be seen that disturbances in the spermiogenesis often occur as the result of degenerative processes in the seminal epithelium; and this is, in my opinion, absolutely the most common cause of such disturbances.

Even inflammatory processes are able to cause morbid conditions in testicles and epididymes, which entail secondary degeneration of the seminal epithelium and often destruction of the sperm-ducts and round-cell infiltration into the interstitium.

Inflammatory changes of the testicles generally produce such palpable clinical symptoms or pathological-anatomical changes that they can be discovered easily in the clinical examination or during post-mortem examination. For this reason, numerous cases of inflammatory testicular changes have been described in veterinary literature. I shall therefore not enter in detail upon inflammatory processes in testicles and epididymes, but refer to the text books in pathological anatomy by Joest and Nieberle-Cohrs, together with W. L. Williams (1921), and Richter (1936 and 1938). However, I do not wish to omit pointing out that, according to my experience, absolutely the commonest cause of testicular inflammation is *infection,* and that trauma as a cause occurs only in exceptional cases. Orchitis in bulls is caused in a preponderant number of cases by infection by *Brucella abortus.* The inflammation commences as a rule as acute epididymitis, periorchitis, and orchitis, with considerable swelling and soreness in the half of the scrotum attacked, together with pronounced clinical symptoms, with high fever and lowered or poor general health. The numerous cases of orchitis due to *Brucella abortus* which have been described in the literature, are also as a rule such acute cases. In my opinion there also occur in bulls, relatively frequently, cases of Brucella infection, which do not show any distinct symptoms. The testicular change is discovered often after a long period of infection by reason of reduced fertility, and it is often then impossible to prove the infectious nature of the malady.

As a rule in acute Brucella orchitis such grave and serious changes occur in the testicle attacked, that it loses, permanently, its capacity to develop spermatozoa. A question of great interest, and also of a certain amount of practical importance, is how the apparently non-attacked testicle behaves. In the acute stage of the disease the non-attacked testicle is of normal size and consistency, and easily displaced in the scrotal bag. After a fortnight or three weeks it feels on palpation as if it were of firmer than normal consistency. On making an examination of the spermatozoa some solitary spermatozoa or none at all are found in the ejaculate; on the other hand, there are plenty of giant cells. A histological examination of such a testicle shows far advanced degeneration of the seminal epithelium. This degeneration is, in my opinion, caused by the non-attacked testicle being subjected to a temperature that is far too high. The serious or high-grade inflammation in one-half of the scrotum results in the scrotum's no longer being able to exercise its heat-regulating function. I have in some 10 cases of acute Brucella orchitis been able, by removing the inflamed testicle as soon as possible after the outbreak of the disease, to discover by an examination of the spermatozoa that the degeneration nevertheless spreads in the seminal epithelium of the non-attacked testicle to such a degree that all development of spermatozoa soon ceases. After a period of two to three months regeneration generally starts again, so that after a further lapse of a couple of months a normal semen picture is obtained. Richter points out (1938) that bulls that have been attacked by acute Brucella orchitis in one testicle, in future have to be looked upon as useless for breeding purposes. My experience in this respect points in another direction. If in the case of acute Brucella orchitis the testicle attacked is removed at once, as a rule full regeneration is gradually obtained in the unattacked testicle, and the bull becomes fertile again. I have saved several very valuable bulls for breeding in this way. Of course, such bulls must be used only in herds infected with Bang's disease.

Morbid Changes or Functional Disturbances in the Accessory Sexual Glands as the Cause of Sterility

Morbid changes in the accessory sexual glands are only sparsely mentioned in the literature; thus, by way of example, Richter does not mention morbid conditions in the accessory sexual glands in his recently-published work on sterility in cattle.

Only a few cases of affection of the accessory sexual glands seem to have been diagnosed in stallions. I have not been able to diagnose any such case in a stallion. Of course, I have many times had well-founded reason to suspect the presence of streptococcal infection in the seminal bladders of stallions in cases where repeated examinations have revealed streptococcus Schütz in the sperm. But since a sterile stallion is not slaughtered, but only castrated, it is impossible in such cases to section the accessory sexual glands.

I have, on the other hand, in my investigations into sterility in bulls been able to prove morbid changes in the seminal bladders in several cases. Thus, by way of example, in cases of Brucella orchitis I have on several occasions been able to prove the formation of abscesses in the seminal bladder of the same side, and also in several other cases of sterility I was able to diagnose inflammatory changes, often with the formation of abscesses on one or both vesiculæ seminalis, due to infection by tuberculosis, pyogenesis, or streptococci. If the formation of abscesses is localized in one vesicula and its outlet passage is shut off by reason of inflammation, the bull may still be quite fertile. But in the majority of cases inflammatory products from the seminal bladder attacked come along with the ejaculate and bring about reduced or wholly ceased fertility. I am convinced that many pronounced cases of affection in the seminal bladders of bulls, which are never diagnosed, would be discovered if the veterinary surgeon in his work in sterility control and pregnancy examination in cattle also made it a habit to investigate the bull's accessory sexual glands per rectum.

W. L. Williams (1921 and 1932), and Webster (1932), have shown that in America and New Zealand sterility in the cows often occurs by reason of the bulls being infected by streptococci in their seminal vesicles and testicles, and discharging streptococci with the sperm. I have in Sweden in my investigations into sterility of cattle been able to prove, in several herds, where the percentage of fertility was very low, that the cows a couple of days after being served had a yellowish-white discharge from the vagina. If in such cases one collects the semen from the bull as aseptically as possible, preferably in an artificial vagina, it is often possible by repeated examinations to prove streptococcal infection in the sperm. Together with Hedström I have found in an as yet unpublished investigation, that such bulls generally have a very low percentage of fertility or are altogether sterile. The semen picture is often normal, except that the motility of the spermatozoa is occasionally somewhat reduced. In some cases the cows have at the same time been suffering from pronounced and serious cervicitis, and did not become pregnant until a fresh bull was used, after long treatment. In other cases the cows do not seem to have suffered any appreciable injury from the infection, but become pregnant relatively soon after being served by another bull. In a bacteriological examination of these cases after slaughter streptococcal infection has generally been proved in the seminal vesicles, in some cases also in the testicles.

In stallions there often exists infection of the sperm by streptococcus Schütz. But as with a stallion there is not always a possibility of obtaining semen sufficiently sterile for a reliable bacteriological examination, and since one has no opportunity to make a control examination of the seminal bladders when the matter concerns a stallion, one must here speak with the utmost circumspection.

Nevertheless, it seems to me that bacteriological examination of samples of sperm should be made more often than is now generally done. We would certainly by doing so, at least when it is a matter of cattle, get an explanation of many cases of wide-spread sterility in a herd. By making use of an

artificial vagina it is now possible, in most cases, to take samples sufficiently aseptic for a bacteriological examination.

Functional disturbances in the accessory sexual glands can in all probability, under certain conditions and circumstances, cause reduced or ceased fertility. In bulls this appears in some cases to be due to a hypofunction with inadequate secretion by the accessory sexual glands, resulting in the sperm being far too concentrated. In other cases the motility of the spermatozoa is affected in a negative direction. Even although in very recent years, partly in connection with works on artificial insemination, valuable investigations have been carried out for the purpose of trying to clear up the physiology of the sexual organs including the accessory sexual glands in domestic animals (Polowzow and Nagajew, Spöttel, Rodolfo, Popoff and Okulitschew, Gunn, McKenzie, and Berliner, etc.), it must nevertheless be admitted that a great deal of obscurity still exists in connection with the physiology of the accessory sexual glands, and the possibility of proving functional disturbances in these organs.

Possibilities of Diagnosing Reduced Fertility

When it is a question of judging the fertility of a male animal, we have many times the possibility of drawing certain conclusions from the results of its previous service. Provided the female animals which the male has served are sexually sound and healthy, this is the best basis for judging. But many times this possibility is not available e.g., when it is a case of young animals that are to be sold. The question then arises if with the aid of clinical methods of examination we shall be able to judge the fertility. In some cases this is possible, and the most important way is then an examination of the male's sperm.

Fundamental investigations into the micropathology of the spermatozoa have been carried out by W. L. Williams (1920-30) and his collaborator and disciple, and also during the last few years by Lagerlöf (bulls), McKenzie (rams) and Rodolfo (boars), and anyone interested in the subject is referred to these works. However, I wish in this connection to point out that a thorough semen investigation with a correct judgment of the importance of pathological spermatozoa calls for a good deal of training, and such work should be entrusted to a special laboratory. One condition for the carrying out of a correct semen investigation is that the sample be taken as aseptically as possible, preferably in an artificial vagina. The judging of the motility of the spermatozoa must be done by the veterinary surgeon who takes the sample. A good guide for work in the field is an examination of semen fixed in opal-blue, particularly if one wishes to investigate the occurrence of unripe spermatozoa.

If a more thorough semen investigation is desired, the one taking the sample makes the slide preparation of the sperm, which is dried in the air and together with the opal-blue preparations and the ejaculate sent to a special laboratory. Here is carried out a counting of the spermatozoa per volume unit and the staining of the slides, preferably according to Williams' method. On the stained semen preparations, under strong enlargement, the number of pathological spermatozoa are counted; in this process 1000 should be counted. In opal-blue it is ascertained whether a large number of spermatozoa with a drop of protoplasm at the head, i.e., immature spermatozoa, are present. If possible, the ejaculate is subjected also to bacteriological examination. In those cases where the ejaculate is fresh, a pH determination also should be made.

The results of the various examinations are summarized. If the semen picture proves to be distinctly abnormal, one may maintain with good reason that the male animal is suffering from a disturbance of the spermiogenesis, with reduced or ceased fertility. If the semen picture is normal in all respects, the male animal is as a rule fertile. Still, there are exceptions to this rule. Especially with functional disturbances in the accessory sexual glands, and also in some forms of infection in these, the semen picture may be seemingly quite

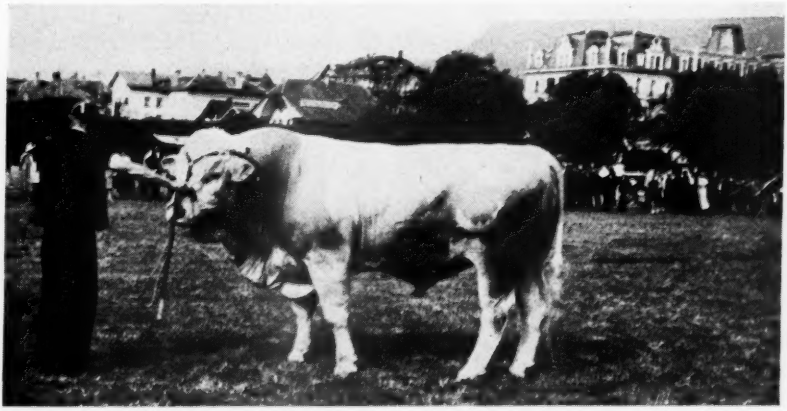
normal, though the fertility in the animal is reduced or has ceased. One should therefore never with the aid of semen examination alone declare that a male animal is normally fertile, but only certify that in the course of the semen examination no changes indicating reduced fertility have been found.

Degenerative atrophy of the seminal epithelium may occur very rapidly, and if the degeneration is slight, a regeneration may very soon take place. One must therefore expect that a male under certain circumstances and conditions may display rather marked variations in the semen picture within a short time. The male animal may, by way of example, at the time of the examination be in a stage of either degeneration or of regeneration, and it is impossible, merely with the aid of *one* semen examination, to settle or decide this. In cases difficult of judging *several* semen samples should, therefore, always be examined at intervals of about one month. Only in this way is it possible to make a diagnosis and prognosis.

As regards the various kinds of animals, the judgment of spermatozoa from bull, ram, buck, boar, and dog is fairly easy, because of the size and shape of the heads of the spermatozoa. On the other hand, it is according to my experience, often difficult to judge the spermatozoa of a stallion.

The treatment of sterility in male animals is a matter of trying to do away with the causes by prophylactic measures as far as possible. This seems to a certain degree capable of accomplishment by improved breeding hygiene, through good care of the animals and good feeding hygiene, and also through protection against infectious diseases, both in stables and in mating. As to the direct treatment, I wish, like Richter, from a breeding hygienic point of view to warn against attempts at bringing about, for example in the case of impotentia cœundi of young bulls, improvement by operative interference, if there is the slightest reason to suspect that the evil may be due to heredity. It is also in the highest degree inadvisable to make use of artificial insemination with sperm from such male animals. The same remarks hold good, of course, with respect to attempts at hormonal therapy in the case of weakly-developed testicles in young animals.

In many cases there exist great possibilities for an animal with severe and serious



Simmental bull at the Interlaken (Switzerland) Cattle Show. This show, held August 26, the last day of the XIII International Veterinary Congress, was a very attractive and highly instructive feature for most of the veterinarians in attendance at the Congress. Nearly all the animals exhibited wore enormous bells, the constant ringing of which practically drowned conversation on the side lines. The herdsmen were dressed in Swiss costumes like the one worn by the man holding the bull. The Simmental cattle, which are more numerous than any other breed in Switzerland, represent an attempt to develop a triple-purpose animal—milk, beef, and work—through selective breeding. Basing a judgment upon the 100 or more entries in this show, the attempt seems to have succeeded in creating three types within a single breed, and in placing the breeder at the disadvantage of not knowing which type the progeny of any mating will produce.

disturbances in spermiogenesis to become fertile again after a few months. It is many times, however, not worth while from an economical point of view to keep a sterile animal and wait for uncertain improvement. I have found that one must consider the prognosis as unsatisfactory if the semen picture does not undergo any material improvement in the space of three or four months. So far we have no safe and certain means by which we are able to influence the spermiogenesis in a favorable direction.

Summary

Infertility or sterility of male domestic animals is worthy of far greater attention than has hitherto been given it, since it is surely a common cause of disturbances in the reproduction of domestic animals. This holds true chiefly in cattle breeding, but in the breeding of horses, pigs, goats, and sheep cases of infertility or sterility of the males also seem to become more and more common. Cases of impotentia cœundi and cases of impotentia generandi where there exist distinctly noticeable symptoms or clear pathological-anatomical changes in the sexual organs, *e.g.*, acute Brucella orchitis in bulls, have to a large extent been observed and described in the veterinary literature. On the other hand, cases of degenerative atrophy of the seminal epithelium with ensuing disturbance of the spermiogenesis and reduced fertility or sterility seem often to have been overlooked or ignored.

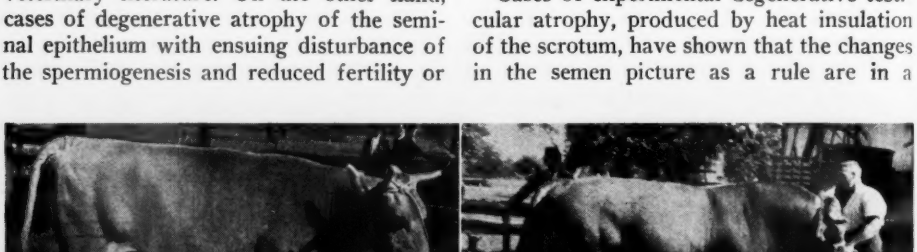
The commonest morbid changes in the testicles which give rise to reduced or ceased capacity for fertility, are according to the author's observations in Sweden, which have been based chiefly on the investigation of sterile bulls: (1) Testicular hypoplasia, about 23%; (2) Degenerative changes in the seminal epithelium, about 41%; (3) Fibrosis testis, about 12%; (4) Inflammatory testicular changes, about 24%.

Testicular hypoplasia is comparatively often met with in young bulls of some breeds when they are put to service. Testicular hypoplasia appears to be hereditary. In the Swedish highland breed of cattle one-sided (left side) hypoplasia of the sexual glands, in both male and female, occurs in 25 to 30% of the animals in the herds.

The most common cause of disturbance in the spermiogenesis seems to be degenerative atrophy of the seminal epithelium, which occurs in various degrees and entails major or minor pathological changes of the semen picture.

Cases of atrophy that are far gone entail fibrosis testis and complete sterility.

Cases of experimental degenerative testicular atrophy, produced by heat insulation of the scrotum, have shown that the changes in the semen picture as a rule are in a



Brown Swiss cow and bull on a breeding and dairy farm at Rapperswil, Switzerland. A trip from Zurich to this farm at the opposite end of Lake Zurich was arranged for those in attendance at the XIII International Veterinary Congress, Zurich-Interlaken, August 20-26, 1938. It proved an interesting, educational, and wholly delightful journey for some 200 veterinarians and their wives who made the trip. The cattle were much admired, at least by the Americans among the party; the dairy barn, however, was a surprise. Its lack of sanitary and hygienic arrangements would cause the rejection of the milk produced in it by any city in the United States having a milk control ordinance. A three-hour return trip on beautiful Lake Zurich amid some of the most attractive of Swiss scenery was a pleasurable end to a delightful day.

direct ratio to the degree of the degenerative changes in the seminal epithelium. Tests have also shown that degeneration can take place in a week or in several weeks. Regeneration, when it can occur, takes as a rule as many months.

Testicular inflammation is mostly caused in bulls by *Brucella abortus*. If the testicle attacked is removed at once, there occur nevertheless degenerative changes in the non-attacked testicle, but regeneration occurs after two to three months, and the bull as a rule becomes fertile.

Morbid changes in the accessory sexual glands are fairly common in bulls, where the formation of abscesses is met with in the seminal vesicles, caused by infection by *Brucella abortus*, tuberculosis, pyogenesis, or streptococci.

Streptococcal infection in the sperm of bulls is a fairly common cause of sterility.

Thorough, repeated semen investigations with a view not only to the number of spermatozoa and their motility, but also to the micropathology and bacteriological investigation of the sperm are of inestimable value for making a diagnosis and prognosis in cases of sterility of domestic animals.

Concerning the treatment of infertility in male animals the main attention must be devoted to prophylactic measures.

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Intestinal Parasites in Horses

By FRANK HARE, Lexington, Kentucky

RAISING horses has been a major industry in Kentucky for over a hundred years. The rolling pasture lands covered with a deep, luxuriant carpet of blue grass, which is never turned by the plow, have a romantic appeal. The region is blessed with abundant moisture and has many other advantages. However, it also has its disadvantages. The lower forms of animal life are protected, by the lush grass, from the destructive action of the sun during the summer months and from the occasional subzero temperatures of winter. At the same time there is provided sufficient moisture for their development. Thus it can be seen that climatic conditions, agricultural practices, and intensity of husbandry all conspire to make internal parasites the greatest problem in the most intensive horse-breeding section in the United States.

The lesson we learn here is not new. The lessons learned by the hog raiser of Missouri and Iowa, the poultry farmer of New Jersey, and the sheep grower of the west, can easily be transposed to horse husbandry in Kentucky, Virginia, Missouri, Illinois, California, Texas, or any place where horses are bred extensively. It is, however, only within the last few years that we have realized the importance of internal parasites in horses.

EVERYONE is familiar with articles published in periodicals, pamphlets, textbooks depicting the ravages of parasites in horses. Can't you see now the languid, emaciated creature with staring coat and dull, lusterless eyes? Further reference to this picture of severe parasitic infestation need not be made. The diagnosis of such cases scarcely requires the expert. It is the more obscure symptoms that I shall discuss.

The skin is an organ in which we readily detect any deviation from the normal. The interrelation between the organs of the body is such that any pathology in one may react on the others. The action of internal parasites in horses on the digestive, endocrine, nervous, and circulatory systems has a pronounced effect upon the function of the skin as well as on these vital organs. If there is any one thing I would emphasize in the summation of tangible evidence in the diagnosis of diseases of horses, it is not to overlook the close interrelationship between the various systems of the body.

The condition of horses is not determined so much by the state of flesh as by the state of the skin including the coat. Is the skin loose and pliable, or, to use the horseman's term, is the animal "hidebound"? Bumps, nodules, and urticaria-like wheals also occur in the skin in even lightly-parasitized horses. This condition is due in some instances to direct skin infection with strongyles, but for the most part it is allergic in character. Animals become allergic to the toxins of internal parasites. The severe pruritus that causes many animals to bite themselves just back of the elbows, frequent yawning, chewing on fences, eating dirt and fecal material, and other symptoms of gastric catarrh, including slow going, and mild cases of colic, all respond favorably to the treatment for bots. Some of these symptoms are commonly regarded as evidence of nutritional diseases, and in part they are. Parasitisms and nutritional diseases go hand in hand. The latter almost inevitably lead to the former by lowering the natural resistance of the host and giving parasites a better opportunity. This is especially true of avitaminoses. But it must be said here that our lack of knowledge of the vitamin requirement of horses is amazing. Nutritional diseases occur frequently in parasitized animals even in the presence of properly-balanced rations. There is considerable difference between taking food into the stomach and intestines and getting it laid down in the structure of the body. One wonders just how many diseases involving mineral deficiency are in reality due to faulty absorption or metabolism. The arthritis in horses described by Mit-

chell, Greenlee, and others cannot be explained satisfactorily on the basis of a wide calcium-phosphorus ratio. Primarily, it looks to me very much like a vitamin deficiency. None who have performed many autopsies on horses, dead of various causes, can fail to be impressed with the chronic inflammatory changes in the intestinal tract, particularly in the colon, due to parasites. One wonders how the animal was ever able to survive such pathology. Normal digestion and absorption are impossible under such circumstances. Parasites deprive the host of a portion of its rightful nutrition, but if that were the only damage they do, we could correct it easily by simply increasing the amount of food. However, the damage done includes injury to the entire body by the absorption of toxic metabolic products of the parasites.

THERE is considerable evidence that the thyroid, parathyroid, and other endocrine glands do not function properly in heavily-parasitized horses. Diseases of the skeleton and parasitism in horses are too closely related for the relationship to be coincidental. It is worthy of note when evaluating mineral deficiencies that enlarged thyroids are common in parasitized horses. The dry, parchment-like skin in parasitism is likely due to an endocrine upset. At a time when periodic ophthalmia is being widely discussed, it is well to recall that for 50 years at least veterinary practitioners have associated this disease with conditions conducive to internal parasitisms, such as swampy pastures, dark stables, and unhygienic surroundings. My own observation over 20 years has been that periodic ophthalmia is always associated with severe parasitism. There are many possibilities. Perhaps the wandering stages of strongyles act as a reservoir for a specific virus; or vitamin A is not absorbed and utilized in sufficient quantities by a parasitized horse; or the liquids of the eye have lost some of their normal microbicidal action.

There is another disease, usually occurring in foals or young horses, characterized by paraplegia or ataxic-like symptoms of all four limbs, that so far has defied investigation. I wonder if it may not be due to the migratory stage of strongyles, encysting in the central nervous system. Such forms have been found in practically all tissues of the body, tendons, liver, spleen, lungs, kidneys, and even the testicles. Some racehorses frequently suffer from loose, foul-smelling bowel movements—parasitic colitis—with a particularly active *B. coli.* This condition is corrected by oil of chenopodium followed by intestinal antiseptics. During the late summer months foals frequently suffer from fever and thumps due to ascarid larvæ passing through the lungs. Foals also have parasitic colitis, usually in the fall of the year. It becomes quite severe, especially when *B. coli,* paratyphoid, and other intestinal organisms increase in virulence from factors conducive to their growth and development.

THE commoner internal parasites of horses are bots, the roundworms, bloodworms, and pinworms. An important point to remember is that, with the exception of the stomach worm Habronema, their transmission does not involve an intermediate host. (In these latter species the house fly or the stable fly apparently functions as intermediate host.) Other facts to remember are that moisture and a favorable temperature are necessary to the incubation of worm eggs, and that it must occur outside the animal body.

Nothing new in the treatment of parasites has been developed during the last 10 or 15 years. It is worth stressing that the value of an anthelmintic is not determined by the number of worms it detroys or expels, but rather by the number of worms that are left in the digestive tract alive and unaffected after its use. It can be seen readily that a drug which destroys 50 worms or removes them from the digestive tract, leaving 500 or 5000 unharmed, accomplishes little. Yet these 50 worms make an impressive exhibit when displayed to an owner or trainer with a graphic description of the virtues of the drug used. Such is being done daily throughout the land in the field of anthelmintic medication, not only with parasites of horses, but with those

of other animals as well. Such demonstrations are the principle stock in trade of the worm-remedy peddler.

Any purgative will remove some worms from horses, the downstream current evidently being stronger than the upstream swimmer. Worms succumb to the infirmities of old age and are removed from the body by normal peristaltic action. Should the host animal happen at the time to be grazing in a pasture where pennyroyal or dandelions abound, the plants are likely to get credit for removal of these worms. You may if you please substitute a powder containing arsenic for the plants mentioned. I think this natural elimination of senile parasites is responsible for the reputation of a large number of drugs, plants, and other agents as anthelmintics.

IN my practice I use the drugs recommended by Dr. Maurice C. Hall. (At this point let me digress to pay tribute to the one who has contributed more to our knowledge of anthelmintic medication than any other man. He will remain a constant source of inspiration to us who were fortunate enough to have known him intimately.) Doctor Hall said: "Carbon disulphide is to all intents and purposes 100% effective in removing bots and ascarids, and the same can be said of oil of chenopodium in removing both large and small strongyles and oil of turpentine in removing Oxyuris." Carbon disulphide is also effective in removing both large and small stomach worms of the species known as Habronema and Trichostrongyles, while oil of chenopodium is effective against Strongyloides. Note that oil of chenopodium is 100% effective against *both* large and small strongyles. This cannot be said for carbon tetrachloride or any other drug. (I particularly mention carbon tetrachloride because it has gained somewhat of a reputation the past few years for being what some choose to call "a good all-around anthelmintic." Just what is the standard for "a good all-around anthelmintic" I have been unable to determine. A drug is either an effective anthelmintic or it is not.)

The method of administration is of little importance. I prefer to use the stomach tube, only occasionally giving carbon disulphide in capsules. Graham's work in Illinois indicating that not all capsules dissolve in the stomach should be borne in mind. I prefer to use fresh material from the original can, and always keep it tightly sealed when not in use. Doctor Hall pointed out that it is the gas given off by carbon disulphide that does the work. I put bran in the capsules after pouring in a dose of carbon disulphide in order to prevent accidents. If an accident should occur and the animal appears to be choking, one or two syringes full of linseed oil injected into the mouth and throat relieve the symptoms immediately. I always give oil of chenopodium in linseed oil *via* the stomach tube, so cannot vouch for the value or the dangers of administering it in capsules. I prefer to use linseed oil as a vehicle because I have yet to find its equal in producing prompt and complete evacuation in horses. Some prefer the castor oil-mineral oil combination, but I have not had free, prompt, and complete evacuation from its use in horses. The dosage of oil of chenopodium recommended by Doctor Hall ranges from 5 to 20cc, depending upon the size, age, and physical condition of the animal. I prefer to decrease the dosage in heavily-parasitized horses.

The use of oil of chenopodium is not foolproof by any means. Delay in its prompt evacuation from the bowels may cause gastro-enteritis and death, and partial absorption of the drug causes a circulatory depression. The use of linseed oil as a cathartic is not foolproof either. Judgment and discretion must be used. Success or failure in the use of oil of chenopodium depends largely upon the preparation of the patient and its after-care.

BEARING in mind the foregoing fundamentals, I usually proceed as follows: Animals to be treated are confined, all hay is removed, and they are given a bran mash the evening before treatment. The following morning, without receiving any food, they are given from 5 to 30cc of carbon disulphide. At noon of that day they are given

equal parts of oats and bran aggregating about two quarts, and at night a similar ration. In the meantime free access to water is permitted. On the morning of the second day oil of chenopodium in the dosage mentioned and one ounce of oil of turpentine in linseed oil are administered. The linseed oil is graduated according to the size, age, and conformation, ranging from 350cc in foals to 1000cc in aged horses. Stallions are given larger doses than mares or geldings. At noon of the second day the horses are fed about two quarts of oats, and this ration is repeated in the evening. The second day also free access to water is allowed. On the morning of the third day all horses are inspected carefully. Animals purging are given hay, but very little drinking water. They are allowed about two quarts of dry oats at each feeding. Before feeding they are permitted to drink about 10 or 12 swallows of warm water from a bucket. Animals that are not purging on the morning of the third day are either turned out in small paddocks to exercise or are walked or exercised under the saddle. Animals that then do not purge promptly are fed bran mashes and allowed plenty of drinking water, no hay being given until purgation begins. Any trouble experienced in the use of oil of chenopodium is due to the failure to follow carefully these fundamental principles, which are applicable to all cathartics.

We usually find that most animals purge promptly the morning of the day after they have received the linseed oil. They purge freely all through that day, at which time the fecal material is thickening to about the consistency of that of a cow.

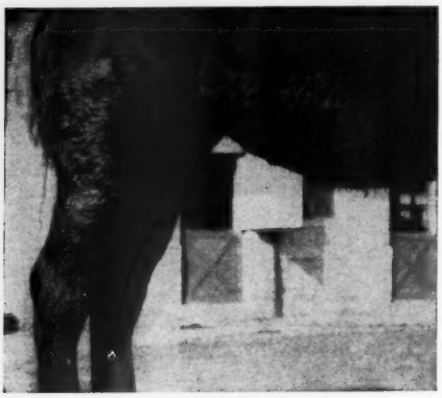
The reason I follow one treatment immediately with the other is that it limits the starvation or preparation period for the two treatments. Horses are set back in their development or lose weight in any period of fasting about as much when the anthelmintic is not given as when it is. The administration of oil of chenopodium requires 36 hours of preparation. Most authorities recommend a 12-hour fasting period for carbon disulphide. I find it convenient to combine the two fasting periods. There is considerable evidence, however, that carbon disulphide is equally effective against ascarids when its administration is not preceded by fasting, and I believe that fewer colics are experienced after the use of carbon disulphide when the stomach is full.

ANTHELMINTIC medication in horses as outlined here causes a rather severe reaction, but effective purgation alone does that, and I can see no increase in the reaction when the anthelmintic is added. After treatment, horses stand in their stalls with their heads down and seem to be indifferent to their surroundings; their appetites are suspended somewhat, but they keep eating a little hay and grain until in about 24 hours the purgation stops and their appetites return. In about six days they are completely back to normal. Owners are likely to be a little concerned at the reaction if they are not warned in advance, although one horseman for whom I have treated probably a half-million dollars' worth of horses always admonishes me to "ball them out good, Doc!"—he feels that the results are in proportion to the amount of purgation. This is true within certain limits.

If a microscopic examination of feces is made about one week after horses are treated with this method worm eggs will be conspicuous by their absence. When horses are treated in the fall after the first killing frost, and again in the spring about the first of June, routine microscopic fecal examination shows a gradual decrease in worm eggs and a corresponding improvement in the physical condition of the animals treated, with the same feeding practices. It is this fact that makes the treating of horses for worms a satisfactory practice; the owner or trainer has something tangible to show for the money expended. We have treated foals two months of age (using a horse catheter for a stomach tube to give the carbon disulphide, and administering the linseed oil and the oil of chenopodium with a syringe); brood mares seven months in pregnancy; and aged stallions. I have never had any unfavorable results where the animal was prepared and given the after-care outlined here.

An Unidentified Fungus Infection in a Horse

A black purebred percheron mare belonging to the Animal Husbandry department of Kansas State College was presented to the veterinary clinic of the college March 17, 1938, for diagnosis and treatment.



Tinea in a Horse

The mare had an abnormal skin condition which had been noticed for about one week. There was a loss of hair and a roughened condition of the skin on the right side of the abdomen and upon the lateral aspect of the right thigh. These affected areas may be seen in the illustration.

There was no hair in the central part of the two affected areas and the hair around the edges was loosened, scaly, and easily broken off. This indicated that the infection was spreading from the inside out toward the edges. There was some edema along the median line just posterior to the sternum.

No external macroscopic parasites being visible, a superficial skin scraping was made. Some of the loosened hair and scales from the edges of the areas were put in a mortar, covered with 10% solution of sodium hydroxide, and allowed to stand for a few minutes. Then some of the material was placed on a clean slide and examined under the microscope. Mycelia were noticed and a diagnosis of fungus infection was made. Since treatment was started as soon as the animal entered the hospital, it was impossible to get a pure culture and the fungus could not be identified.

Treatment: The mare was isolated to prevent spreading of the infection.

The first treatment consisted of painting the affected areas with an antiseptic having this formula:

℞

Camphoræ ..... 2 parts
Phenol ..... 1 part
Petrolatum liquidum ..... 3 parts

This formula will be referred to as Prescription No. 1.

Treatment was as follows:

3/17/38—Painted affected areas with Prescription No. 1.

3/18/38—Painted affected areas with Lugol's solution.

3/19/38—Painted affected areas with Lugol's solution.

3/21/38—Painted affected areas with Prescription No. 1.

3/22/38—Washed affected areas with soap and water.

3/23/38—Painted affected areas with Prescription No. 1.

3/24/38—Gave the mare a bath in 1% creolin and pine oil, 1% to keep the infection from spreading to other parts of the body.

3/25/38—Painted affected areas with Prescription No. 1.

3/26/38—Painted affected areas with Prescription No. 1. Fecal examination was made and *Strongylus equinus* eggs were found. The mare was given by stomach tube 100cc of butyl chloride in four pints of mineral oil and one pint of castor oil.

3/28/38—Painted affected areas with Prescription No. 1.

3/29/38—Washed with 1% creolin-pine oil solution. Painted wtih Prescription No. 1. At this time the fungus was spreading on the left side of the abdomen, but on the right side hair was beginning to grow in the central portion.

3/30/38—Clipped hair around affected areas and painted with Prescription No. 1.

3/31/38—Painted affected areas with creolin sulphur ointment.

4/1/38—Painted with creolin sulphur ointment.

4/2/38—Painted with creolin sulphur ointment.

4/4/38—Painted with Prescription No. 1. Gave 1 oz. of sodium iodide in 500cc of distilled water intravenously.

4/5/38—Painted with Prescription No. 1.

4/6/38—Observed and rested.

4/7/38—Observed and rested.

4/8/38—Painted with Prescription No. 1.

4/9/38—Painted with Prescription No. 1.

4/11/38—Bathed in 1% pine oil and liquid soap solution.

4/12/38—Gave 1 oz. sodium iodide in 500cc distilled water intravenously.

4/13/38—Painted with French ringworm remedy, consisting of equal parts of Tincture of iodine, Chloral hydrate, Glycerine.

4/14/38—Painted with French ringworm remedy.

4/15/38 to 4/18/38—Rested.

4/19/38—Painted with Prescription No. 1. Gave 1 oz. sodium iodide in 500cc of distilled water intravenously.

4/20/38—Painted with Prescription No. 1.

4/21/38—Washed with soap and water. Gave 1 oz. sodium iodide.

4/22/38—All the areas were completely covered with hair. The case was kept under observation until four days longer and then dismissed.

The treatment of this case was changed repeatedly. It appeared that the use of the creolin sulphur ointment was a turning point in the treatment of the case.

Clipping the hair around the edges of the affected areas, grooming out all loose hair, and bathing with creolin and pine oil kept the fungus from spreading.

GEORGE B. MAICHEL.

Overbrook, Kans.

[*Comment:* Conditions like that shown in the illustration are usually diagnosed simply ringworm by practitioners. Cases having a similar appearance have recovered promptly when clipped and given a few applications of a 2% solution of methylene blue in alcohol.]

Orchitis, a sequel to mercuric iodide treatment of epizoötic lymphangitis.—Photo by Yutuc.

At Last

My mother used to tell me that if a person wanted anything long enough, he would finally get it. A recent experience seems to justify this belief.

In the days of my young manhood, long before I ever thought of being a veterinarian, I attended one of my young draft mares at a normal parturition. With the foal came a disc about five inches across, thin on the edges, and about one inch thick in the center. It was about the color of liver, but tougher. I put it on top of the barnyard gate post where it became perfectly hard after drying in the sun for a few days.

Through the years since then (which have included a moderately-extended lifetime of constant association with all kinds of live stock) I have never seen or heard of anything of the kind, although I have in a limited way searched through veterinary publications for reference to it.

In fact (to use a polite expression), I have frequently consulted the best minds in the obstetrical field for information about this mysterious disc. In every case, I was emphatically told (reducing the words to everyday parlance), "There is nothing to it." In one case that I remember I was even told that possibly I had been drinking extra bad liquor that particular day!

But finally there appeared, in the April issue of VETERINARY MEDICINE, page 167, an article by Doctor Feinberg, which at least proved that there are a few people who have heard of such a thing. Of particular interest to me was its name: Hippomane. They say the first part of it is Greek; the whole name, as well as its origin and function, have always been Greek to me.

The question asked by the state board, according to the article mentioned—"What is a hippomane?"—reminds me of the medical student who was asked on his final examination to give the function of the spleen. He never liked the doctor who was holding the examination, so in answer to the question he wrote: "No one knows the function of the spleen except Dr. Blank and God Almighty." I think an answer like

this would have been a fitting response to the state board in question.

Occurrences like this make me thankful that I will never have to pass another state board examination. They also make me glad that I still read VETERINARY MEDICINE.

REMBRANDT MORGAN.

Winfield, W. Va.

* * * *

Cautery for Granulation Tumor

In August of last year I was called to remove an extensive exuberant granulation that involved the entire posterior portion of one hind leg of a horse from the hock to the fetlock. It extended around on each side and involved fully one-half of the leg, protruding about 2½ inches. It had a fetid odor.

The growth had developed as the result of a minor injury two months previously. It was much like the photograph shown on page 223 in the May issue of VETERINARY MEDICINE by Dr. E. T. Baker, except that it did not protrude so much but involved a considerably greater area. It had been treated by several empirics; I think it had had about everything mentioned by Doctor Baker, and in addition liberal applications of caustic potash, Japanese oil, spirits of turpentine, and several kinds of liniment.

Because of the extensive area involved, and the vascular nature of the growth, I decided against surgical procedure, telling my client that I did not see anything to cut off except the leg, and that as it had been a good, young work horse, I did not consider such an operation practical, but would proceed along other lines.

As is customary in such cases, the neighbors had gathered to hear first-hand what the veterinary surgeon had to say. I explained to them briefly that I knew very little about such things, but that they were called by several names. One grisly old farmer said he did not know what to call it, but that he did know that it was one hell of a leg. To this they all agreed.

After having the boys build a fire, I found some heavy wire, and on the end of two pieces bent hooks about two inches long, at right angles to the remainder of the wire. Placing these hook ends in the fire, I got them red-hot; then, holding the long end of the wire, I inserted the hook end into the keloid to the full length of the bent part. Using one hook while the other was heating, I repeated the procedure until the entire mass had been perforated at intervals of about 2½ inches. A cloth covered with an escharotic paste was then applied to the leg, and held in place by a bandage for nine days. When it was removed, a slough about three-quarters of an inch thick came away. This burning and bandaging process was repeated three times, at nine-day intervals. By that time the keloid had sloughed down to a level with the surrounding normal skin. It was then treated as an open wound. Three weeks later the horse was put to light work, and was working regularly every day. The place is almost entirely haired over, and the leg is but slightly thickened.

I might add that no anesthetic or restraint of any kind was used during the burning processes, but there was frequently the rather pleasant odor of frying horse flesh.

When I hear discussions about treating this kind of cases by feeding powders, or injecting bacterins, it reminds me of the story I once heard about the prize fight promoter who called up a hotel to reserve a bed nine feet wide and 12 feet long for the champion. The bell-boy who answered the 'phone said to the manager, "Well, that is some bunk."

I am reporting this case because I never saw this method of treating these cases described in veterinary literature, and because I thought it might help some brother practitioner save his reputation as a great surgeon.

REMBRANDT MORGAN.

Winfield, W. Va.

Stallions and Jacks Increase in Numbers

A noteworthy increase in the number of stallions and jacks licensed for public service in recent years is announced by the Bureau of Animal Industry, U. S. Department of Agriculture.

During the three years, 1935, 1936, and 1937, the number of stallions licensed for public service in 22 states having enrollment laws was 18% greater than for the previous three-year period. The increase for the last three years is a continuation of an upward trend that began in 1933 and was especially prominent in the draft classes. The increase in numbers of licensed stallions during the last three years occurred chiefly in the purebred classes. This is a reversal of the trend for the previous three-year period, and, if the present use of purebred stallions continues, it should result in a gradual improvement in our national work-horse stock. The number of jacks licensed for public service during the last three years was 7% greater than the number licensed in the previous three years. Unlike the trend in stallions, the gains in jack enrollments were greater in the grade, scrub, and mongrel class.

Reports which the Bureau of Animal Industry has received from various sources indicate there is a scarcity of good jacks in the United States and the enrollment data for public-service jacks amply verify such reports. They also indicate that little progress is being made to remedy the situation.

The estimated number of horses on January 1, 1938, was 2.5% less than at the same time in 1937. There was a greater reduction in total numbers of horses during 1937 than in 1936, the report shows, despite the fact that more colts were raised in 1937 than in 1936. This is attributed primarily to the unusually high death losses in several states from equine encephalomyelitis and other causes. The estimated number of mules on farms on January 1, 1938, was 2.1% less than for the same time in 1937.

MILK-WHITE FOAL NOT AN ALBINO

March 28, 1938, a bay mare belonging to a client of Dr. A. A. Brockett, Little Falls, N. Y., gave birth to a milk-white foal. The mare had been purchased a few months previously at a sales barn and no breeding history is available. The colt's eyes, hoofs, and sheath, are black, but there is not a colored hair on its whole body

Combating Systemic Bacterial Infections in Veterinary Practice*

By CHARLES E. FANSLAU, Orange, N. J.

THE problem of effectively combating bacterial infections in animals is of great concern to us all. From the time it was first demonstrated that bacteria and filtrable viruses are the causative factors of many serious diseases, scientists, in their effort to save lives and alleviate suffering, have directed their researches to the discovery of chemotherapeutic agents.

Among the noteworthy contributions to the various branches of medicine, developed from these researches within the last half century, none have created such widespread interest as the sulfonamide group of drugs and their application in the treatment of infections due to the highly virulent hemolyticus streptococcus and other bacteria.

Gelmo, in 1908, was the first to mention sulfanilamide or p-aminobenzene sulfonamide as a new chemical discovery in the dye industry. In the following year Hoerlein, Dresel, and Kothe prepared the first azo dyestuffs with sulfonamide and substituted sulfonamide groups.

It was not until 1932, however, that the effectiveness of certain dyes and their therapeutic value in the treatment of septicemia in mice was discovered by Domagk, Director of the Experimental Pathological Laboratory of Elberfeld, and his coworkers, Mietsch and Klarer. Domagk and his chemists then synthesized a new drug which later became known as neoprontosil (formerly called prontosil). In Domagk's work it was found that the infected animals recovered after the administration of from one-tenth to one-fiftieth of the tolerated dose of neoprontosil in from three to five days, whereas the untreated controls lived only 24 hours or at the most 48 hours.

Outstanding among the sulfonamides is prontylin—the original preparation upon which an extensive bibliography is based and which, among the numerous commercial preparations, conforms to the highest standards of chemical purity. Results from the administration of a product of such standards are, of course, less likely to be complicated by by-effects and reactions due to impurities, and eventually prove the most reliable. Although many practitioners have affirmed that their results from the oral administration of sulfanilamide are very satisfactory, the ideal treatment, as reported from numerous cases and as I have observed, consists of the simultaneous administration of oral prontylin and injectable neoprontosil. The injection of neoprontosil alone is invaluable when treating animals too weak or incapable of receiving oral medication. Another notable advantage is that such medication precludes the lamentable practice of lay treatment, since it leaves the veterinarian who alone is qualified to judge the progress of the patient and supervise treatment, in complete control.

Neoprontosil is chemically disodium-4-sulfamido-phenyl-2-azo-1-acetyl-amino-1-hydroxynapthalene 3.6 disulfonate and is, for brevity's sake, described as a complex azo dye which breaks down in the animal body releasing only a minute amount of a sulfonamide radical. Inasmuch as the amounts of sulfonamide present are much too small to exert therapeutic influence alone, the action is dependent on the molecule as a whole. Unless one wishes to attribute such satisfactory results to the small amount of sulfonamide, it must be assumed that neoprontosil is capable of producing added chemotherapeutic actions in the body.

The phenomenal recoveries from streptococcic and other bacterial infections in humans which have resulted from the administration of neoprontosil led to the investigation of possibilities of this promising therapeutic agent in the treatment of diseases in animals. Since it was the pharmacologic testing of neoprontosil on experimental animals which had established its safety and efficacy, the possibilities in the

*Presented at the 32nd annual meeting of the Georgia State Veterinary Association, June 20, 1938.

veterinary field were obviously undisputed and its use was widely adopted immediately.

A report which appeared in the April, 1938, issue of VETERINARY MEDICINE illustrates how useful neoprontosil has become in the large animal field. The author relates that he treated a generalized septicemia in a four-year-old thoroughbred racehorse with the intravenous injection of 125cc neoprontosil 5% solution. A second injection was given in 48 hours. Twelve hours after the second injection the temperature, pulse, and respiration returned to normal, the appetite was good, the swelling had decreased, and weight was being placed on the infected leg without apparent pain.

One week later, although the wound had not yet completely healed, the animal was put to walking exercise, going level and freely.

Neoprontosil has proved its merit in the small animal field as evidenced from experiences both in this country and abroad. Successful results were reported following its administration in the advanced stages of distemper, tonsillitis, meningitis, gastroenteritis, and urinary infections; in septicemic conditions in all domestic animals following puncture wounds involving tendon sheaths and joints, operations, and puerperal sepsis. Streptococcal mastitis and metritis in cows, joint-ill and pneumonia in calves, strangles, purpura hemorrhagica in horses have been successfully controlled with neoprontosil treatment.

The dosage in which neoprontosil is most effective in small animals is 2cc per five pounds of body weight, whereas for large animals, horses and cattle, an aggregate dosage of 100 to 150cc daily is required.

The best results are obtained when the total dosage is divided into several administrations given at from 4- to 6-hour intervals because the drug is eliminated almost entirely in that space of time and it is desirable to maintain a sufficiently high concentration of neoprontosil in the bloodstream.

Following neoprontosil injections there is a rapid reduction in fever and a general improvement in the condition of the animal. In cases of septicemia the organisms in the blood disappear quickly.

With the indications mentioned, the uses of neoprontosil, however, are not exhausted, for a number of investigators are conducting studies which indicate that there are numerous associated conditions in which this chemotherapeutic agent might prove the drug on which the practitioner may depend for lowering mortality, and assuring fewer complications and quicker recovery.

* * * *

Chronic Prolapsus Vaginae Relieved

The following is a description of a chronic case of prolapse of the vagina, os uteri, and rectum in an 8-year-old Guernsey cow and a treatment that proved successful.

At first the prolapse occurred toward the end of pregnancies, and was relieved in the usual manner by sutures, truss, standing the animal with the hind feet higher than the forefeet, etc. The condition gradually became worse with each pregnancy until even when not in calf the cow would strain and evert the vagina, which in time became hard and leathery. For any relief the "Ide" truss had to be worn continuously.

The straining and expulsion were more noticeable during estrum, so I decided to remove the ovaries to see what effect that would have.

Putting the cow next to a wooden partition with a rope under her belly, I shaved, disinfected, and anesthetized for the flank operation, also giving a spinal anesthetic. It was my first experience at spaying a cow, but after considerable fishing I succeeded in removing the ovaries.

The skin wound healed normally and the cow showed no further tendency to expel the vagina or rectum since. Possibly the atrophy of the uterus and shrinking of the ovarian ligaments following the operation account for the cure.

Never having seen anyone who had a cure for these persistent cases of prolapse, I have thought this report may prove interesting to others.

W. V. P.

New York.

Importance of Nursing in Encephalomyelitis

The illustration depicts in part the emphasis Dr. S. L. Stewart of Olathe, Kansas, places on nursing in the treatment of infectious equine encephalomyelitis. It is Doctor Stewart's experience that nearly all horses suffering from this disease die, regardless of treatment, if they are permitted to lie down, and a primal requisite in successful treatment is keeping the animals on their feet all the time from the development of the first symptoms until they are well — three to seven days, usually four or five days.

At the beginning of the outbreak in Kansas last June, Doctor Stewart taught the man shown in the illustration — Mr. Clarence Victor—his system of nursing and he has kept him busy continuously ever since, caring for encephalomyelitis patients.

The paraphernalia is constructed of two heavy side poles, extending from the manger into the wall of the barn behind the horse; a sitting pole crosswise behind the horse, for him to sit on, which he does for hours at a time, and a breast pole in front. The side poles are wound with hay fork rope, making a sort of hammock for the horse to rest in. The head is tied three ways, with sufficient slack to allow the horse to sit back on the rear pole. A rope passes over the neck, from one side pole to the other, and each foot is tied with a rope to keep it where it belongs. There are no nails in the construction of the stanchion, as it was found they will not hold. Baling wire is used to tie the paraphernalia together, except where the side poles are mortised into the wall of the barn.

Victor remains with the patient every minute, 24 hours a day. He sleeps in the stall or in front of the patient, usually remaining for four days, when the animal is convalescent, and then moving on to the next case. During the whole season, he has nursed only two cases that have died.

Doctor Stewart uses anti-serum and symptomatic treatment.

* * * *

In azoturia of a gelding, unless it is able to rise within 48 hours, the chances of recovery are not very bright. Mares seem to do better, and with careful nursing, may remain down a week and finally recover.

* * * *

Three sources of information are open to the wide-awake practitioner: first, observation; second, professional magazines; third, association meetings. Visiting with other practitioners is always profitable—we come home with some new and useful ideas.—*E. T. B.*

Heat Stroke in Cattle

April 30, 1938, Dr. C. D. Ebertz, of the Kansas State College ambulatory clinic, was called to see three cows that were down along the roadside. The writer accompanied him.

The three cattle were part of a large herd that had been driven about 35 miles in the past two days. They had been on wheat pasture during the spring.

Case 1.—This cow, down in a ditch along the road, was a black, six-year-old, 800-pound grade cow with a two-weeks-old calf at her side. She had a temperature of 108.8°F., respirations 90, and the pulse was rapid and weak. Marked dyspnea was shown by extension of the head and mouth breathing. Palpation over the loin, ribs, and brisket revealed marked emphysematous crepitation, indicating probably a rupture of the lung.

Treatment.—She was given 60cc of camphorated oil intramuscularly, 125cc of cal-so-cose, and one quart of saline solution intravenously. The owner was advised to put cold water on the head and back of the animal. Upon a return trip two hours later the animal had shown but little improvement, and destruction was advised.

Case 2.—The second animal was an aged, 1000-pound, medium-conditioned Hereford cow due to calve in about two weeks. The temperature was 109°F., respirations 85, and the pulse weak and fast. Dyspnea was pronounced, as in Cow No. 1, but palpation over the animal showed no emphysematous crepitation. This animal was in convulsions, with marked salivation.

Treatment.—She received 90cc of camphorated oil intramuscularly, 125cc of cal-so-cose and two quarts of saline solution intravenously, and ¼gr of atropine sulphate subcutaneously. Cold water was poured on this animal also.

A return call was made in the afternoon, at which time temperature of 106°F. and respirations 70 were observed. She was then given one quart of saline solution intravenously and ½gr of atropine sulphate subcutaneously; but died about 7:00 p. m.

Case 3.—This was a thin Hereford cow with a two-weeks-old calf at her side. She was found lying in milk fever attitude, with temperature of 102°F. and respiration of 40. Since she had been running on wheat pasture, the case was diagnosed as grass tetany.

Treatment.—300cc of 20% calcium gluconate solution was given intravenously, and the animal made an uneventful recovery.

Summary

No post-mortem examinations nor blood tests were made because of the difficulty of working under field conditions, but it is assumed that cow No. 3 had a hypocalcemia. As the other two cases had been kept under identical conditions it is thought that the lowered calcium of the blood stream (due to pasturing on wheat), fatigue from the long drive, and the sudden change in temperature combined to produce the heat stroke in cases No. 1 and No. 2.

CHAS. B. RANDALL.

Bethel, Kans.

A Diminutive Calf

I believe the illustration to be of the smallest calf ever to live. At birth it weighed exactly three pounds; after a gestation period of 274 days. It was born on the very

Lula Belle at the age of 49 days

cold night of January 20, 1938, on the farm of Mrs. Stella Pilsudski, of North Judson, Indiana. When found, in the morning, it was near death from exposure.

Mrs. Pilsudski carried the little heifer calf to the house, placed it in a wash tub, by the stove, and gave it two teaspoonsful of milk every two hours. With this treatment it revived rapidly, getting on its feet in four days, and becoming very active. The teaspoon feeding was continued for two days; the third day a bottle with a nipple was used; and soon the calf began to call lustily for its milk at feeding time.

When one month of age, this calf was taken to the barn and bucket fed. On March 10th I saw and weighed little "Lula Belle", and though it may seem hardly believable, she tipped the scales at 45 pounds (49 days of age). The accompanying illustration bears witness to the development of this midget calf at that time.

There is no history of abortion in this herd, and both sire and dam of this calf are of the large Guernsey type.

I have frequently read of the birth of extremely large calves, but never of a diminutive calf comparable to this one. I believe this must be a near record, and for that reason I make this report. I was not present at the first weighing of Lula Belle, but have the testimony of six people who were present.

To Mrs. Pilsudski, I think, great praise is due for her determination to save this little animal. She battled against the judgment of all other members of her family, whose desire was to kill the calf which they considered of no value.

W. A. HECK.

Knox, Ind.

* * * *

Actinomycosis in Feeder Steers

Actinomycosis is a chronic infectious disease of cattle, and less frequently of swine, horses, and man, characterized by chronic suppurative processes or by formation of connective tumor-like masses. In cattle this disease is commonly known as lumpy jaw or wooden tongue.

Actinomyces bovis is generally considered to be the cause of lumpy jaw, while *Actinobacillus ligniersi* is the etiological factor of wooden tongue. Both organisms are of the ray fungus type, and are gram-positive club-shaped rods. The diseases are interrelated, and manifest almost the same process. Actinomycosis is often an infection of both bone and soft tissues; there is a destruction of bone lamellæ, and later the formation of new bone by a proliferation of periosteum. Later, the process spreads to the surrounding soft tissues inducing a suppuration. The process is gradually walled off and large tumor like masses result, which may be hard or soft depending upon whether fibroblasts or leucocytes predominate.

Actinomycosis is of much greater economic importance than many veterinarians realize. It is beyond doubt on the increase. In the past stockmen and dairy men regarded the disease as 'just a lump full of pus', and they would merely make an incision to drain it. It is now of a universal distribution and is a definite menace in many sections, especially in intensive cattle feeding and dairy districts.

The writer saw a case last spring in which the client complained of an unusual amount of lumpy jaw. Out of a herd of some 700 stocker and feeder cattle, 65 were affected, either seriously or in the first stages of the disease. The majority had a large lump on the jaw. One steer showed a lumpy process on the last rib which when examined revealed a slight quantity of pus. Another steer, which was losing weight rapidly, had a nose three times normal size and experienced difficulty in breathing due to a narrowing of the air passages. There was no suppuration of any kind in the process. About one-third of the enlargements examined contained no pus pockets, only an enlarged mass of hyperplastic tissue.

One ounce of sodium iodide in one pint of water was administered intravenously to each 1000-lb. steer, or according to size. The lumps which upon exploration indicated pus pockets were incised and the cavities drained and packed liberally with gauze soaked in tincture of iodine.

One week following this treatment, sodium iodide was again administered intravenously to the more severe cases, which included about one-half of those formerly treated. Some of the more advanced cases required up to six treatments.

Extreme caution was taken to prevent contamination of the premises and possible further spread of the infection by thoroughly disinfecting the suppurative material drained from the actinomycotic processes.

During the month of April, 85 cattle were treated for actinomycosis. In one lot of 125 cattle, 42 were affected. Three steers in this herd had open abscesses from which pus was dripping. All except three complicated cases made a satisfactory recovery.

A peculiar phenomenon of this disease, pointed out by the owner of the cattle, is that when a feeder steer being fattened for market becomes infected with this disease and is showing good flesh it makes as

good a gain as any of the steers in the feed lot; however, on the contrary, stocker cattle that are being roughed through invariably lose condition when affected; some of the cattle continue to lose until they become merely skin and bones.

The sodium iodide therapy has eliminated to a great extent the uncertainty of treatment since it cures most of the more stubborn cases as well as the wholly hyperplastic lumpy jaw.

A. R. BLYTHE.

Norman, Okla.

* * * *

Lungworm Infestation in Cattle

Nature.—During the past few years an increasing number of losses on widely separated farms in Illinois of mature cattle as well as calves have, upon examination, been associated with parasitism. Some types of subclinical parasitism are difficult to diagnose, and probably occur unrecognized in many herds. However, unthriftiness not explained by other causes should prompt examination for parasitic infestations. Mild parasitic infestations often cause unthrifty, stunted calves, slow gains in the feedlot, or reduced milk flow in dairy cattle. Advanced cases may culminate in a chronic bronchitis, peribronchitis, and atelectasis. Both dairy cattle and calves, as well as beef cattle and steers, infested with lungworms (*Dictyocaulus viviparus*) have come to our attention.

Life Cycle.—The life cycle of the lungworm of cattle is not completely known. The adult worm, which is two to three inches long, is found in the air passages of the lungs where the eggs are laid. After the eggs are coughed up and swallowed, they hatch in the intestinal tract into microscopic larvæ and are passed out in the feces. Cows become infested by eating grass or drinking water contaminated with the larvæ. Thus, old, poorly-drained pastures often play a part in perpetuating the disease, although larvæ rarely survive the winter in pastures in cold climates. Chronically infected older cattle carry the infestation over winter. Therefore, it would seem advisable to keep calves separate from adults during the grazing season.

Symptoms.— In one outbreak of lungworm infestation complicated by intestinal parasites on a farm in the Ohio River lowland, 35 yearling steers died. In addition to the death loss and the feed loss, failure of the surviving animals to gain in weight was an important item. An owner of an infested herd commented, "These steers just simply starve to death eating good feed." Edematous swellings appeared under the jaw in several of the animals that succumbed, although this symptom was not observed in all the affected animals. Advanced cases of lungworm infestation may culminate in sudden death following movement or driving of the animals from one pasture to another, although mildly affected animals may survive for weeks or many months in a weakened condition. Affected animals may show varying degrees of unthriftiness, anemia, emaciation, diarrhea, and spasmodic coughing (husk) and appear to be improperly fed or underfed.

Diagnosis and Treatment.—A diagnosis of lungworm infestation may be made upon autopsy of affected animals or by demonstration of larvæ in the feces. The worms are visible in the air passages on careful naked eye examination. Affected herds coming to our attention on different occasions have been treated for various diseases before the nature of the malady was established. The treatment of lungworm infestation in cattle prescribed by veterinarians is symptomatic and includes tonics and good feed, together with methods of management to keep animals away from poorly drained contaminated pastures. Old pastures apparently favor the development of lungworm infestation in cattle.—*Pathology Exchange,* Univ. of Illinois.

* * * *

During the last 30 years, the Council of Medical Education and Hospitals of the American Medical Association has spent over a million dollars in surveying medical colleges and hospitals and in establishing and urging the use of ever rising standards of education in the colleges and of service and instructional opportunities in hospitals. —*Hygeia,* 16:5.

Abdominal Surgery in the Dog

By NORMAN E. ANDERSON
Guelph, Ontario
Ontario Veterinary College, '39

ABDOMINAL surgery is an art which is developing rapidly in human medicine and is being quickly followed in small animal surgery. Therefore, the small animal practitioner will have to become proficient in this branch of surgery to meet the ever increasing demands of the public.

In many cases the history may lead one to suspect a foreign body in the stomach or small intestine. If x-ray is not available, and palpation does not reveal anything an exploratory laparotomy is the only method by which a correct diagnosis can be made and success in this venture is entirely dependent on attention to minute and careful detail.

The peritoneum resents rough handling and prolonged exposure. Rapid yet minutely careful work is the desideratum in all cases of abdominal surgery. As space will not permit a description for the many indications for abdominal surgery the writer will describe in some detail three important operations in canine surgery, namely:

1. Gastrotomy—indicated for the removal of foreign bodies from the stomach and lower esophagus. 2. Enterectomy—indicated in gangrene of the bowel. 3. Cystotomy—in the case of cystic calculi.

For all types of abdominal operations the patient should be prepared by withholding all food for a period of 24 hours and washed out with normal saline, rendering the intestinal canal as free of organisms as is possible. Enemas are of value here in the process of cleansing the digestive track, also purgatives of an oily nature.

The lower gut should be empty before the operation is performed and a catheter should be used to empty the bladder. The area is shaved clean and scrubbed with soap and water and finally swabbed with alcohol. Proper temperature of the operating room is very essential, in no case should it drop below 70°.

A complete anesthetic is desirable reducing the possibility of shock. The anesthetic used is a matter of opinion (the writer prefers ether preceded by 1/80 to 1/100 grain atropine, which dries the saliva and thus reduces the chances of suffocation due to the saliva going down the trachea). Nembutal is widely used with good results. The atropine should be given half an hour before the ether. Anesthesia should be obtained with as small a dose as possible.

A flat position on the table is usually adopted, but if the pelvic viscera are involved as in cystic calculi the head should be considerably lower than the rest of the body. All modern small animal tables are provided with apparatus for quick adaption to the position required.

This position must not be adopted in obstruction in the lower part of the esophagus for in these cases there may be a gravitation of offensive fluids into the mouth which may cause suffocation.

Antiseptics are not deemed advisable in abdominal surgery. All instruments should be sterilized by boiling.

Instruments Required

The following instruments have been found quite complete for any form of laparotomy.

Two Bard Parker scalpels No. 3 with No. 10 blade.
Six pairs of artery forceps.
Four pair towel forceps.
Two wound retractors.
Two pairs bowel clamps.
One pair curved scissors.
One pair straight scissors.
One pair surgical rubber gloves.
One pair of grasping forceps for removing foreign bodies. The Campbell obstetrical forcep with non pinch handle is quite satisfactory.
One needle holder.
Six half curved needles No. 7.
Thirty inches of chromic gut No. 1 (boilable 20-day).
Thirty inches of silk worm No. 00.
Six feet of linen or silk No. 2.

Four or five sterile towels.
One sterile sheet to cover the patient.

In planning the incision for the abdominal operation the main thing to keep in mind is access to the part to be exposed. The medial line is best in the majority of cases. The incision should never be placed too near bony or cartilaginous boundaries of the abdominal wall. The incision must be placed so as to insure adequate blood supply and avoid, as far as possible, the danger of defective union of the parts and post operative hernia.

Gastrotomy

Place the patient in a flat position on the table. A median or paramedian incision, 3 to 4½ inches long, is made approximately three inches above the umbilicus according to the size of dog. After incising the muscles see that all hemorrhage has stopped before opening the peritoneal cavity. The cavity is opened by grasping the peritoneum with a pair of dissection forceps and drawing it up, being careful not to grasp any of the viscera, then incising it with a pair of scissors. The stomach is recognized by its position under the liver and withdrawn through the incision. The incision is packed with sterile towels wrung out of warm saline solution; a longitudinal incision is then made along the great curvature and with the forceps the foreign body removed. This incision is then closed by means of a Czerny-Lembert continuous suture. The stomach is then swabbed with a normal saline solution and returned to its position. The peritoneum and muscles are next sutured with a continuous gut suture and the skin is sutured with an interrupted stitch of silk or linen. The after care will be described under enterectomy.

Enterectomy

This operation is performed for the removal of sections of gangrenous gut after strangulation intussusception or penetrating wounds, etc. The intestine should be empty before the operation where possible.

The animal is placed in a flat position on the table. The area is carefully prepared by shaving and washing with soap and water and finally an application of alcohol. A sterile sheet is placed over the animal and an incision made at the same site as for spaying. The incision should be three to four inches long. The gut is withdrawn through the incision by means of an ovariectomy hook. The peritoneal cavity is protected by sterile cloths packed round the incision.

The gangrenous portion is now located and the bowel clamped on either side of the seat of operation, thus preventing escape of intestinal contents. The affected portion is next removed with scissors, the incision being made well into the healthy tissue. There is a choice of two methods for closing the intestinal wound. The first is probably the better for the beginner, that is inserting a gelatine capsule into each end of the divided bowel, the ends are then sutured close to the margin, the Lembert suture being used with cat gut No. 00. The other method is the suturing of the two ends without any special apparatus. Two stitches are inserted right through the whole thickness of the bowel wall and left long for the assistant to hold. The next sutures are of the Lembert type and placed close to the edges of the wound. A double row is usually used. All vessels in the mesentery should be ligated before removing the gangrenous portion of the gut. This type of operation is known as the end to end anastomosis and is the one most frequently used. The other type, known as the lateral anastomosis, is a more difficult and complex operation and is not used to any great extent in our work.

After the bowel is returned to the peritoneal cavity pick up the abdominal muscles and peritoneum and suture them with a continuous cat gut suture. The skin is next sutured with an interrupted silk suture or linen No. 2. The sutures are removed according to the healing from the second day on, and should be all out within six days.

The patient is placed in a clean warm airy kennel. All food is withheld for 36 hours. The animal is then put on a diet of milk and raw eggs for a week.

The writer does not advise the use of

stimulants but rather favors the administration of glucose intravenously.

Cystotomy

The only indication for this operation in small animals is cystic calculi which can be diagnosed, as a rule, by palpation. The operation is a simple one with no special risk and the results are usually very satisfactory.

The technique is much the same as in gastro-laparotomy. The animal is placed on the table with the head considerably lower than the rest of the body. The site of the operation is in the median line about two inches in front of the pubis. The area is prepared in the usual way and the patient covered by a sterile sheet through which the operator works. After an incision is made the bladder is lifted out and packed round with sterile cloths. A longitudinal incision is made in the bladder large enough to remove the calculi, being careful not to touch the uretors. The calculi should be, where possible, removed in one piece.

After removal of the calculus the bladder is sutured with a continuous double row of Lembert sutures. A small tube is inserted into the wound to allow for escaping urine. There are two methods of closing the abdominal incision. The peritoneum and muscles are sutured with a continuous cat gut followed by suturing the skin with an interrupted silk or linen suture.

The second method is the placing of a deep suture through skin muscles and peritonium. These sutures are placed at intervals of about one-half inch and between each of these deep sutures a shallow suture is placed just through the skin. These deep sutures are removed from the second day on, according to the amount of swelling. The deep sutures should not be pulled too tight as they will cut and prevent a perfect union of the parts.

The after care is much the same as has been described previously. Diuretics are not indicated. The animal should be fed on a light laxative nutritious diet and kept in a clean comfortable kennel away from other dogs. Recovery is complete in about two weeks.

MEDICATION OF SHEEP

Demonstration of a simple method of dosing sheep at the 19th Illinois Veterinary Conference, University of Illinois, Oct. 5, 6, 7, 1938. By this method only an ordinary, rubber bulb dose syringe is used. Aspiration of the medicament is wholly prevented by merely closing the nostrils with the left hand while making the injection well back into the mouth. No other precaution is taken. The medicament up to two ounces is injected all at one time and the animal immediately released.

Veterinary Progress in Germany

Schmaltz[99] describes the Congress as a celebration of the great progress and improved status of the German veterinary profession under the Third Reich. This followed particularly from: (a) the Order (Reichstierärzteordnung) of April, 1936, which assigned to the profession not only the care of animal health, but also a share in the public health service, and (b) the creation of an independent veterinary department (Veterinärabteilung) of the Ministry of the Interior, Doctor Weber, Leader of the Veterinary Profession (Reichtierärzteführer), becoming "Ministerialdirektor." At the same time Schmaltz criticizes as a backward step the merging of the Berliner Tierärztlich Hochshule into a Veterinary and Agricultural Faculty (Landwirt-Schaftliche-Tierarztliche Fakultät) of the University. The formal proceedings of the two-day Congress are described.—*D. H. Willson.*

[99] **Schmaltz, 1937. Der erste Deutsche Tierärztetag (The First German Veterinary Congress—in the Third Reich. June, 1937); *Dtsch. Tierärztebl,* 4: pp. 277-79. Abst. from *Vet. Bul.,* 8:8, p. 541.**

Hilton Retires as Veterinary Director General

Dr. George Hilton, V.S., H.A.R.C.V.S., D.V.M., Veterinary Director General of the Health of Animals Branch, Dominion Department of Agriculture, will retire Dec. 31, after 33 years of distinguished service.

Dr. Hilton was born at Verkator, Russia, of English parentage. He came to Canada in 1888 with his parents, who settled at Headingly, Manitoba. He later entered the Ontario Veterinary College and was graduated with honors in 1897, and engaged in general practice at Portage la Prairie, Manitoba.

In May, 1905, Doctor Hilton was appointed Chief Veterinary Inspector, Health of Animals Branch, Dominion Department of Agriculture, with headquarters in Ottawa. He continued in that position until 1924, when he succeeded the late Dr. Fred Torrance, as Veterinary Director General.

Doctor Hilton was the Canadian representative on the Executive Board of the American Veterinary Medical Association for fourteen years and occupied the position of Chairman of that Board. He is a member of the United States Live Stock Sanitary Association, the Canadian and American Public Health Associations, honorary member of the Manitoba, Saskatchewan and Alberta Veterinary Associations, and Honorary President of the Central Canada Veterinary Association. He was the official Canadian representative to the Eleventh International Veterinary Congress held in London, England, in 1930 and was elected honorary associate of the Royal Veterinary College. He is a member of the Permanent Committee of the International Veterinary Congress and represented Canada at Geneva in 1935 on a Special Sub-Committee of the Economic Committee of the League of Nations, dealing with international shipments of meats and meat food products.

In recognition of his long and distinguished services in the realm of veterinary science the honorary degree of D.V.M. was conferred on him by the University of Montreal in 1936.

It is a tribute to the efficiency of Doctor Hilton's predecessors and himself that there has never been an outbreak of foot-and-mouth disease in Canada; nor a case of dourine reported in Canada for the past 18 years, nor of sheep scab in 10 years. The

Dr. George Hilton, for 14 years Veterinary Director General of the Health of Animals Branch, Dominion Department of Agriculture

measures for the control of Bang's disease have been developed under Dr. Hilton's administration; glanders, mange and rabies have been effectively dealt with when reported. Progress has been substantial in recent years towards the eradication of bovine tuberculosis in the Dominion. More than one-third of all cattle in Canada are under supervision for the eradication of bovine tuberculosis and accredited areas are being established and extended. But perhaps his outstanding achievement in disease control, certainly by contrast with achievements across the border in the U. S., has been his handling of hog cholera. The tax of hog cholera on producers or consumers of Canadian swine has been held down to $175 per million swine marketed. In the U. S. the cost is $500,000 per million swine marketed or 2,857 times as much. Doctor Hilton has never permitted any department of the Canadian government or anyone else to ship virulent hog cholera virus indiscriminately to hog raisers or others. The handling of hog cholera has always been a veterinary job in Canada.

Dr. A. E. Cameron, Chief Veterinary Inspector, will be Acting Veterinary Director General until a successor to Doctor Hilton is appointed.

Protozoal Diseases of Swine

By F. VOLKMAR,
Chicago, Illinois

PROTOZOAL invasions and infections in swine are deemed to be rare. However, in the absence of exhaustive scientific examination generally prevailing in the swine field, this may be more apparent than real. In a monograph on the protozoan parasites of domestic animals, published in 1910, Crawly [1] lists only one protozoan, *Sarcocystis miescheriana,* as occurring in swine. Since then, especially during the more recent years, our knowledge concerning protozoal diseases of swine has been enriched steadily by new discoveries. It is true, those protozoal conditions that have been described in the literature so far do not seem of great economic importance. Nevertheless, it is to the advantage of every practicing veterinarian to know something about the potentialities of protozoa as disease agents in swine. With this intention in mind, the following survey of the American veterinary literature is offered.

Sarcosporidiosis

Creech [2] has described well marked alterations in the musculature of swine, caused by heavy sarcosporidial infection. He found little evidence of tissue reaction, but he considered it reasonable to assume that the marked microscopic degenerative changes noted in the muscle fibers may have been caused by some toxic substance slowly eliminated by the numerous sarcocysts present in the musculature. He states that the opinion is held by some that sarcosporidiosis accompanies other conditions or diseases which have left the animal in a depleted condition, and that the parasite invasion of the tissue follows as a natural sequence, because of the lowered resistance of the animal. He quotes Virchow (1866) and Minching (1903) as attributing intermittent paralysis and paralysis of the posterior extremities as symptoms of sarcosporidiosis in hogs.

Amebiasis

Walker [3] investigating the parasitic amebae of the intestinal tract of man and other animals, described *Ameba intestinalis* as a new species from the pig in the United States. Smith [4] concluded from his observations and experiments that the ameba in pigs is a parasite of the normal intestine. It multiplies rapidly in fresh exudation products and migrates to the mucosa deprived of its protective covering. He says that the same rule appears to govern the behavior of the Balantidium of the pig.

Kinsley [5] furnished a brief description of an enteritis in swine which was accompanied by myriads of amebae in and upon the affected mucosa. The symptoms are a temperature of 106° to 107°F., impaired appetite, thumping, profuse diarrhea, emaciation, a wabbly gait and weakness. Death may ensue in 24 to 48 hours. The mortality is relatively high. On autopsy the intestinal mucosa is acutely inflamed and covered with a rather loosely adhering exudate, having the appearance of clabbered milk. According to Hearrington (quoted by Kinsley), good results in treatment are obtained from the following prescription:

Bichloride of mercury
Copper sulphate
Iron chloride.....aa 2 ounces
Water q.s. .....ad 1 gallon
M. Ft. Sol.

Sig.: Use one tablespoonful of the stock solution to each gallon of drinking water, or of the water for soaking the feed.

Trichomoniasis

Dimock [6] observed numerous cases of diarrhea and colitis in shoats. He attributed the cause of these conditions to *Trichomonas suis* infection. Death took place suddenly in the fatal cases. The most striking gross pathological evidence of disease was an enormously enlarged liver, about four or five times normal size, brownish mottled in

appearance, and exceedingly friable in consistency. On incision almost no blood escaped. Dimock encountered also Balantidium invasion in his investigation, and an ameba; he considered the latter non-pathogenic.

Ciliates

Hegner[7] believes that balantidia from the domestic pig may belong to two species, *Balantidium coli* and *Balantidium suis*, but that this has not been proved satisfactorily as yet. Balantidia from the Philippine wild pig resemble those of the *suis* type from the domestic pig, but may be a separate species.

Schumaker[8], having previously demonstrated that the presence of a large quantity of starch in the diet of the pig caused a pronounced increase in the number of Balantidia, found that a heavy infection with these parasites was accompanied generally by an intestinal flora which contained greater numbers of aciduric organisms and lesser numbers of lactose fermenters and proteolytic anaerobes.

Ratcliffe[9] states that the pathogenic species of Endamoeba and Balantidium have identical effects upon the mucosa of the large intestine of susceptible hosts. The primary and perhaps total effect of the organisms is merely necrosis. They enter the tissue only after necrosis has taken place, except as a post-mortem or late ante-mortem change. Apparently, the protozoa elaborate a cytotoxic or necrotizing substance that causes tissue degeneration. The lesions are invaded by intestinal bacteria also. Hence extension of tissue necrosis may be due to a combination of factors, and the inflammatory response may not be attributed to the parasites alone. The resistance of the host must be impaired before the intestinal tissues become subject to necrosis.

Frey and Meleney[10] studied ten young pigs with reference to their natural intestinal protozoa. They found amebae-producing uninucleate cysts having the combined characteristics of *Endamoeba polecki* and *Endamoeba debliecki* in all the pigs. The other natural intestinal protozoa encountered included Iodamoeba, Trichomonas, Chilomastix, Giardia, Balantidium, and a coccidium. Infections with Balantidium were eliminated by a single dose of 0.6gm heptylresorcinol in olive oil, administered in soft gelatine capsules. A course of treatment with carbarsone (50mgm per kilo body weight daily for ten days, in milk) eliminated the polecki and debliecki amebae from all the pigs permanently.

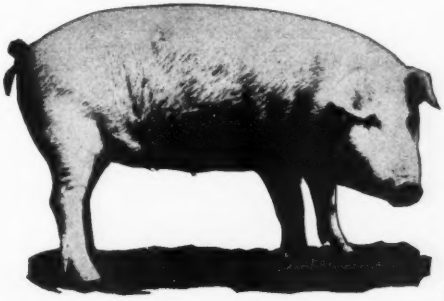
Coccidiosis

Becker[11] lists five species of coccidia as having been reported from the pig. Four of them were Eimeria species and one of them an Isospora species.

Biester and Murray[12] believe coccidiosis, caused by *Eimeria debliecki* to be an important but heretofore overlooked disease of swine in America. They found that experimentally infected pigs developed marked clinical manifestations. Bloody diarrhea was not observed, but constipation was noted. The wall of the large intestine exhibited pronounced thickening.

Kinsley[13] maintains that the manifestation of intestinal coccidiosis in swine varies according to the intensity of the infection and the condition of the swine. Unthriftiness and bloody feces are about the only symptoms. The principal lesion found on necropsy is a thickening of the intestinal mucosa and hemorrhages as a result of the slough.

Biester and Schwarte[14] produced complete immunity to coccidiosis, in pigs by feeding them oocysts daily for periods of 100 days and longer. The animals ceased to eliminate oocysts before 100 days were up, and acquired a complete, though fleeting immunity, lasting 18 days or more.



Biester and Murray [15], in the course of their studies on infectious enteritis in swine, discovered an Isospora species, which they named *I. suis*. Experimental *I. suis* infection, produced anorexia and diarrhea followed by constipation. Infection is not fatal, but produces intestinal alterations and destruction, sufficiently pronounced to retard growth for a time, and thus may be responsible, in part, for the unthriftiness. These authors caution against overemphasizing the rôle of either Eimeria or Isospora as pathogens in swine.

Spirochetosis

Howarth [16] found spirochetes always associated with scirrhous cord and bull nose in pigs. He was able to reproduce the two conditions in healthy hogs by inoculating into the snout or in the scrotal region small pieces of tissue from the lesions containing the spirochetes. Characteristic gangrenous lesions like those occurring in scirrhous cord and bull nose could be produced on other parts of the body at will by placing a small piece of tissue, containing spirochetes, into a pocket-like incision in the subcutaneous tissue. King and Baeslack [17] published a report of the observation of spirochetes (Borrelia hyos) in the blood of hogs suffering from hog cholera. They were of the opinion that the organisms were of etiological significance, but subsequent investigations have shown that they are not the causative factor of hog cholera. The occurrence of spirochetes in the intestinal ulcers of pigs suffering from hog cholera were described by Smith as early as 1899.

Ray (1936) mentions "Black Scour" as an enteric condition caused by spirochetes. He recommends Fowler's solution in doses of two drams daily per 100 pounds live weight as a specific treatment against spirochetal enteritis.

Anaplasmosis

Kinsley [18, 19], Doyle [20], and Dicke [21] described a disease of growing pigs, three to eight months old, in which cellular inclusions, resembling anaplasma organisms, were found in the red blood cells. The first symptoms noted are depression, followed by weakness and dyspnea. A day or two later, icterus and anemia become apparent. Animals which are moribund have very pale blood; the plasma or the serum is yellowish, and the red cells show spontaneous agglutination at times. Death, preceded by fever, occurs on the fourth or fifth day of illness. Autopsy reveals yellowish discoloration of the liver. The heart muscle and the kidney parenchyma show gross evidence of degenerative changes. Ascites, hydrothorax, and hydropericardium, characterized by the presence of icteric fluid are found sometimes.

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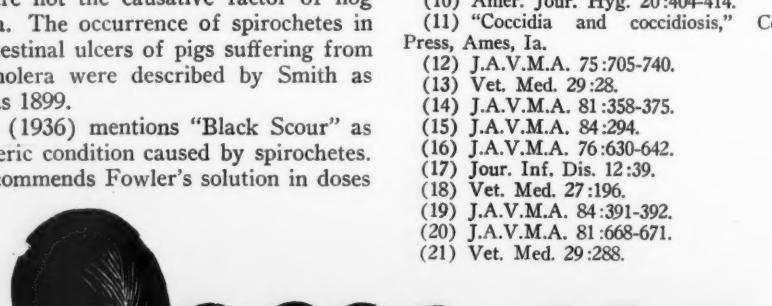

Superfetation in a Chester White Sow

It was indeed fortunate that this unusual phenomenon happened on a pure-bred hog farm; since thus we have the exact record of breeding dates.

The Chester White sow shown in the illustration farrowed a litter of 10 pure-bred pigs last spring; her first parturition. She was bred again on May 11, 1938, and on June 5th she showed signs of estrum and was again mated with the same sire. She farrowed a litter of perfectly normal pigs, eight in number, September 2nd and naturally her owner thought the breeding on June 5th was a false alarm. About ten days following farrowing, the owner noticed a sagging of the abdomen and concluded that she probably had ruptured herself in the farrowing of September 2nd.

The night of September 27th, he called me and told me he had a sow that was attempting to vomit. I made the trip to the farm to find, to my amazement, this sow farrowing another litter of pigs, nine in number, all perfectly normal. What the owner assumed to be attempts to vomit was, of course, labor preceding the farrowing.

It is interesting to note that there was 25 days between the breeding dates as well as between the farrowing dates. Without doubt the litter of eight were conceived in one horn and then for some unaccountable reason the other ovary functioned and she conceived the nine pigs in the other horn.

I would like very much to know if there are any other authenticated cases of this kind on record, that is photographs and dates to bear out the record. This sow is a registered animal—Gold Leaf Connie, No. 528238, and is owned by Mr. D. C. Gamble, R. F. D. No. 2, Lima, Ohio. She was farrowed by Connie No. 509272 and sired by Typy Gold Leaf No. 431325. The sire of the two litters of pigs is Perfect Lad No. 433889. All 17 pigs are doing well.

D. M. SWINEHART.

Elida, Ohio.

Doctor Swinehart (left) holding two of the younger litter, Mr. Gamble holding two of the older litter. At the far right is shown the dam with both litters

* * * *

Successful Anti-Distemper Vaccine For Foxes

At an annual meeting of fox raisers at Hamburg, Wisconsin, August 31st, Doctor Green of the University of Minnesota announced that a fox distemper vaccine, developed as a result of six years' research, had afforded complete protection against distemper to 16,000 fox pups and 7,000 adult foxes to which he had administered it. The research was financed by Fromm Brothers of Hamburg. During the last three years the loss from distemper has averaged $600,000 annually. The vaccine, it is said, will lift from the fox industry the heaviest burden under which it has labored and make the production of furs less expensive and less hazardous.

Technique and Interpretation of Post-Mortem Examinations of Swine

Altogether too little importance is given to the technique of holding an autopsy or post-mortem examination. Every pig "posted" should be considered a possible cholera subject. Its blood should be considered virus, and every precaution taken to prevent it from being scattered about the lots or premises. The veterinarian should make the owner realize its possible danger and have him take the necessary steps to prevent its dissemination. It is gross carelessness for the practitioner to step into the blood, or to permit others to do so.

After the hog is killed and bled, it should be held on its back. The thoracic and abdominal cavities are opened by incisions from the angle of each jaw to the pelvis in the flank. By lifting off the venter wall of the abdomen and thorax thus separated an examination of the cervical glands, the glottis, inguinal glands, bladder, kidneys and spleen can be made without the hands being soiled materially. Next, examine the lungs and heart and lastly the liver, stomach and intestines. Care is to be taken that the contents of stomach and bowels are retained in the abdominal cavity.

The foregoing can all be accomplished without detaching any organ from its natural attachments and without leaving the animal in an unsightly condition. When the examination is completed, the skin is to be tied together with wire, so that no portion of the carcass or organs are left to be scattered elsewhere. The carcass should then be burned. The ground where the blood was spilled should be soaked with a strong disinfectant. The owner's estimation of the ability of the veterinarian is often enhanced by the evidence of a careful technique in post-morten examinations.

Diseases of swine are recognized by the history, symptoms and lesions as in other species, cholera not excepted. Practitioners and field investigators must disregard the mistaken idea that cholera is a lesionless disease. If this were so, the only time one would be warranted in making a diagnosis of cholera would be when one has no evidence to support one's decision.

Cholera.—Three definite lesions are so constant in hog cholera that they may well be classified as characteristic. They are:

1. Peripheral congestion of lymph glands, especially the cervical and mesocolic glands.

2. Ecchymotic hemorrhages on the lung. These are distinct, circumscribed hemorrhages varying somewhat in size, but larger, as a rule, then the petechiae found elsewhere. They do not rub or wash off, nor do they run together as the knife is drawn across the surface of the lung.

3. The spleen is usually involved in cholera. There may be only congested areas, but more frequently it is enlarged, soft, and darkened in color.

Other petechial lesions are not so constant, therefore not so important. The petechiæ of the kidneys are of minor importance. Lesions may be found also on the glottis, heart, bladder, stomach, liver and gall bladder. The bone lesions are of little importance in field work.

Flu.—The lesions most frequently encountered in flu are enlarged and congested lymph glands of the cervical region; the congestion extends through the glands. The lung presents a mottled appearance as the result of lobar pneumonic areas. The bronchi and bronchioles are surrounded by an area of inflammation involving but a small portion of the lung tissue. The bronchial glands are frequently enlarged and congested, and the mucous lining of the trachea is quite constantly congested.

Necrotic Enteritis.—In this disease there is diffuse necrosis of the mucous membrane lining either the large or small intestine. The membrane affected may be much thickened, and either tough, or granular and mealy. Frequently we find the necrosed membrane assuming the character of a false membrane lining the cecum. It is thin, dark in color, and on removal discloses a very acute inflammatory condition beneath it.

Swine Plague or *Hemorrhagic Septicemia.*—The lesions of this disease predominate in the thoracic cavity. They are characterized by diffuse or blotchy hemorrhages of the serous membranes or organs. There may also be similar hemorrhages in the abdominal cavity and in the muscle tissue. Wherever found, the hemorrhages are irregular in outline. The bronchial lymph glands, or any others that may be affected, are congested throughout. In the very beginning there may be only small hemorrhages on the heart, or extreme congestion of the lungs that will be followed later by all stages of hepatization. There is usually more or less pleuritic adhesion. The spleen is not involved.—*J. S. Koen.*

The Feeding of Orphaned Pigs

One of the serious consequences of agalactia in sows is the loss of suckling pigs. The feeding of so-called orphan pigs is economically worthwhile. In caring for them, whenever possible, they should be permitted to suckle another sow, at least once or twice, before being fed a modified milk. The approximate composition of sows milk is fat 7%, albumen and casein 6%, sugar 5.7%, and ash 1%. The fat globule of sow's milk is about one-fourth the diameter of the fat globule of cow's milk; it is therefore more easily digested. The average sow produces from four to seven pounds of milk daily. The average litter varies from eight to ten pigs. Therefore, the average pig consumes about one-half pound of milk daily. A modified milk that has been fairly successful in supplying the demand of orphan pigs is prepared as follows:

1 lb. cow's milk
1 lb. lime water
¼ lb. separator cream
⅛ lb. sugar (preferably milk-sugar)

Pigs from one to ten days of age should be given approximately one-half pint daily equally divided into four or five feedings. The basic principle that pigs should not gain weight until they are ten days of age should always be kept in mind when feeding orphans. After the pigs have reached the age of ten days, the composition of the prepared milk can be gradually changed by reducing the lime water, cream and sugar. When the pigs are three weeks of age they can be fed on whole cow's milk. Pigs from two to three weeks old may be given small quantities of grain to advantage.

The amount of milk supplied, and not the pig's capacity, should regulate the quantity consumed. Indigestion, diarrhea, stunting, enteritis, and death are penalties of over-feeding.

A. T. Kinsley.

Kansas City, Mo.

Hernia of the Spleen In Swine

On post-mortem inspection of the viscera of a hog, the spleen which appeared normal otherwise was found to exhibit on the surface of its capsule numerous raspberry-red, partly spherical, partly pyramid-shaped nodules[48], approximately the size of a buckshot; some of them were pediculated. The pulpa of the nodules was similar to that of the spleen in consistency. On cross-section the continuity between spleen pulpa and nodular pulpa was apparent. Histological examination revealed that the spleen capsule was partially ruptured, and that the nodules represented hernias of the spleen.

Susceptibility to Swine Erysipelas

The composition of the food[49] is of great importance with regard to the resistance of pigs to experimental infection with virulent cultures of *Erysipelothrix rhusiopathiae.* In tests carried out, pigs given fodder rich in protein, calcium and phosphorus resisted experimental infection. Pigs given a diet rich in protein and phosphorus, but deficient in calcium and vitamin D, as well as those kept on a diet rich in phosphorus, but deficient in protein and calcium, all contracted the disease, and 28% of each group succumbed. It is concluded, therefore, that it is not the lack of protein, but the deficiency in calcium and vitamin D, which is responsible for the lowered resistance of pigs to swine erysipelas.

[48] Schönberg, F. 1937. Milzgewebshernien beim Schwein, eine bei der Fleschbeschau häufig beobachtete, aber oft nicht erkannte Veränderung. *Zeitschr. f. Fleisch u. Milchhyg.* 47:140.

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Oat Awns a Cause of Interdigital Abscesses in Dogs

On July 7, 1937, a female Scottish terrier, aged seven months, was presented at the veterinary clinic of Kansas State College for treatment of sore feet. On examination discharging puncture wounds were found in the first, second, and third interdigital spaces of each foot. An object protruding from the wound of the second interdigital space of the left front foot proved when extracted to be an oat awn. Two awns were removed from this one wound by means of thumb forceps. One oat awn was removed from each of the other wounds of this foot. On the right foot both the first and second interdigital spaces harbored two of the awns, and the second interdigital space had parts of a third. The third and fourth interdigital spaces each had parts of one awn present. Each wound of the hind feet also yielded an awn.

These awns were all removed by means of thumb forceps and the areas examined carefully to insure that all of the awns had been removed. An antiseptic of 1:1000 bichloride of mercury in alcohol (alcoholic sublimate) was then applied to the different areas by means of a small amount of cotton on the end of an applicator. The puncture wounds healed quickly.

These oat awns were later identified as *Avena fatua,* commonly known as wild oats. (This animal may be said to have been harvesting its wild oats with the usual disastrous results.) The description of this plant is that the culms are from 30 to 75 centimeters tall, erect, and stout. The leaves are numerous, the blades flat and usually four to eight millimeters wide, and scabrous. The panicle is loose and open; the slender branches are usually horizontally spreading, the spikelets usually three flowered, and the glumes about 2.5 centimeters long. The rachilla and lower part of the lemma is clothed with long, stiff, brownish, or sometimes whitish hairs which are at times scanty. The florets readily fall from the glumes. The lemmas are nerved above, about two centimeters long, the teeth acuminate and not setaceous. The awn, which was the cause of the trouble in the dog, is stout, geniculate, twisted below, and three to four centimeters long. This is one of the characteristics by which it is differentiated from the other species of oats. The other two methods of differentiation are

that it has a distinct articulation of all grains of the spikelet and that the outer palea is covered with hairs of varying lengths, color, and thickness, terminating in an abrupt point.

The awn of this grain is particularly adapted to produce trouble because it is present on all grains of wild oats, strongly developed, geniculate, and twisted below the knee.

This oat, which grows in cultivated soil and waste places, was introduced from Europe. In this country it is rare in the eastern states, but does grow from Maine to Pennsylvania. It is found from Missouri westward and is a common weed on the Pacific coast. The seed is used for food by the Indians.

On the Pacific coast small animal practitioners commonly report the finding of these wild oat awns in wounds. It is therefore a good practice in this locality to examine all suppurating wounds of small animals for awns.

W. R. WHITTIER.

Brookfield, N. Y.

Dog Feeding Trials Precede Human Nutrition Discoveries

The march of science has not shaken the dog's place as "man's best friend". For ages the companion and guardian of man in the hunt, on the farm, and at the hearth, the dog has gone into the modern laboratory with scientists bent on solving the mysteries of health and nutrition.

Many important scientific discoveries of how human diseases may be prevented and cured have followed experiments in which research workers first tested their theory by "trying it on the dog".

The reward for the dog's help in this work is not man's alone, for the dog too has benefited. In discovering how human diseases may be combated, scientists at the same time have found the cure or preventive for the corresponding disease in the dog.

Much of science's knowledge that has cut down the death rate among humans from pellagra has come from a study of the corresponding dog disease, "blacktongue".

Pellagra is a deficiency disease. Deficiency diseases are not the result of infection, but come from the absence of some essential element in the diet.

The factor in foods that prevents pellagra is a vitamin link in the vitamin B complex. It is one of the water soluble vitamins, closely related to the growth vitamin, known variously as vitamin G, vitamin B_2, or lactoflavin, because it is abundant in the watery portion of milk.

By feeding dogs various diets and noting their effect in regard to blacktongue, scientists gather much useful information in fighting pellagra. Recently a group of research workers made an important discovery regarding the dog's own diet requirements while working on a pellagra problem. By feeding five dogs a diet deficient in the pellagra preventing factor, they soon induced blacktongue symptoms, from which one of the dogs died. They then proceeded to cure the blacktongue symptoms by adding to the diets a supplement containing the pellagra preventing factor.

Suddenly, however, three of the dogs died. Although they no longer suffered from blacktongue, something still was missing in their diets. The one surviving dog collapsed. Quickly the research workers administered riboflavin (identical with lactoflavin) intramuscularly. Within 12 hours the dog had recovered and was normal.

This experiment and its unexpected turn proved two things to the scientists:

1. Lactoflavin is essential in food for dog life.

2. The various factors of the vitamin B chain are interdependent—they must all be present in adequate amounts if the dog is to be healthy and live.

These conclusions, of course, have an application to human diet.

Another group of scientists, searching for more facts about vitamins in diet, conducted feeding experiments with 500 dogs and puppies. They found that deficiency of vitamin A, causes symptoms of respiratory distemper but that dogs that are fed rations rich in vitamin A are able to resist the disease even when deliberately exposed to it. The same experiments also proved that puppies failed to grow and weakened and died unless their diets contained ample supplies of lactoflavin and vitamin B_2. Lactoflavin deficiencies also caused symptoms of intestinal and nervous distemper.

Recent research, therefore, emphasizes the thought expressed by this writer, in these pages several years ago, that "many of our apparent disease problems will become better understood only in the light of a more complete knowledge of the nutritional requirements of the dog".

JOHN W. PATTON.

East Lansing, Mich.

Incidence of Worm Infestation in 100 Dogs

By MORRIS ERDHEIM, Ithaca, New York
N. Y. State Veterinary College, '39

THIS study was undertaken to ascertain the correlation between intestinal parasitic infestation and other diseases, to determine the prevalence of different types of parasites, and to investigate the relative incidence of infestation at the various age levels and in different breeds of dogs. It was based on a study of intestinal parasites in 100 dogs in the vicinity of Ithaca, New York.

The fecal samples gathered from the clinic kennels were examined, and the records of the animals from which the samples were taken were investigated in the clinic files for information regarding the reason for admission to the clinic, age, and breed.

Technique Used in Making the Fecal Examinations

Although the direct smear method takes less time than the concentration method, the latter was used, since it is simple to do, and it also indicates the relative degree of infestation.

About one or two grams of feces were suspended in about 10cc of water. The suspension was strained through a simple tea strainer, such as can be purchased at a five-and-ten-cent store, into a centrifuge tube. The tube was filled one-third with the suspension, and then filled to the top with glycerine. The tube was then shaken and centrifuged for three minutes at 1000 r. p. m. With a glass rod a drop from the surface was removed, touched to a slide, and examined under the microscope.

In this procedure, either glycerine or sugar solution may be used. Glycerine was used in this study, but many prefer the sugar solution, which is cheaper and easier to work with. The glycerine apparently has a higher surface tension, which causes the drop to hump up, making microscopic examination more difficult unless a cover slip is used. The practitioner who has no time to prepare simple syrup may use a commercial syrup such as Karo.

Although many seem to obtain satisfactory results using a 50-50 mixture of glycerine and fecal suspension, it was found that the specific gravity of this mixture was too low to raise the whipworm eggs,

TABLE I

	No. Examined	No. with Parasites*	Ascarids	Hook Worms	Whip Worms	Tape Worms	Both Hook & Ascarids
Spay	37	8	3	2		2	1
Traumatic Injuries	9	0					
Sarcoptic Mange	4	4					
Demodetic Mange	5	4	1	2			2
Seborrhea	2	1		1	2		
Eczema	5	3	1	1			
Gastritis, Enteritis	5	5	2	1	1		
Prolapsed Rectum	2	2		2	1 2		
Abscess	4	4		3		1	
Fits	7	5	2	1		1	1
Distemper	8	0					

* Only the dogs which were treated were taken into account; the Group I cases are not included in the data.

although it does raise the eggs of other intestinal helminths. This method is easily adapted to anybody's practice, and those practitioners who have no centrifuge facilities, may let the mixture stand overnight to permit the eggs to rise to the surface, with equally good results.

By keeping conditions relatively constant; that is, by using the same amount of feces and water and the same centrifuging time, one can soon appreciate the importance of one's findings in terms of relative infestation. In this study, the positive cases were classified Group I, Group II, Group III and Group IV infestations, on the basis of the average number of eggs per field. The Group I infestations were not treated, but were re-examined.

Infestation in the Clinical Groups

Table I shows the prevalence of worm infestation in the various clinical groups.

All of the positive spay cases but one were only mildly infested. The one heavily infested was 5½-month-old Airedale pup, which had both hookworms and roundworms. In other words, the oöthecotomy group, as well as the traumatic injuries and the distemper groups, was relatively free from worms, while in the other groups the percentage of infestation was high.

There was no apparent relationship between the number of eggs in the feces and the condition of the host. Many of the severely-emaciated dogs with hookworms showed few eggs in the feces, while dogs which appeared in fairly good health showed many eggs. This agrees with Dederick's observations. One explanation which has been advanced for this is that the severe enteritis set up by the parasites makes the intestine an unfavorable habitat for them, thus automatically reducing their number.* The same explanation might be made for the freedom from infestation in the distemper group, the enteritis set up by distemper acting in the same way to make the intestine an unfavorable site for parasitic growth. This theory is not borne out, however, by post-mortem reports, as it is not uncommon to find large numbers of parasites in the gastro-intestinal tract of dogs dying from distemper.

It is interesting to note that in all the cases of demodetic mange observed by me the mange mites were easily detected in the feces on the other hand, although other reports refer to the presence of the sarcoptic mite in the feces, no mites were found in the feces of the sarcoptic cases that were examined in this study.

The feces of dogs infested with whipworms uniformly show the presence of other parasites. This is true of all whipworm cases reviewed in the literature, as well as of those examined in this study. Dederick reported that all the whipworm cases he found showed hookworm infestation also.

One of the whipworm cases was of sufficient interest to merit individual discussion. The dog was brought into the clinic in November, 1937, to be treated for a prolapsed rectum. On fecal examination it was found that it suffered from a severe whipworm infestation in conjunction with roundworms. The animal was treated with chenopodium to rid it of the roundworms, and the rectum was sutured to the abdominal wall to prevent another rectal prolapse. Typhlectomy was not resorted to at that time because the whipworm may be localized in the colon rather than in the cecum, and it was thought inadvisable to remove the cecum until it could be demonstrated that the worms were situated there. The patient was therefore given high rectal injections with various vermifuges at intermittent periods, but no whipworms were recovered from the feces, although they continued to show high egg counts. Since the high rectal injections had no effect, it was concluded that the worms were in the cecum, and that typhlectomy was indicated. When the cecum was removed, it was found to be full of the worms. Incidentally, although the dog had been in the clinic for six months, he had not rid himself of the disease, despite Whitney's conclu-

*Another explanation is that the greater total amount of feces evacuated in a given period thins out or "dilutes" the egg concentrations. Thus an animal having fairly uniform egg concentration showed only one-sixth as many eggs per gram of feces when a severe diarrhea was induced and conversely a concentration six times as great as "normal" when marked constipation was induced.

sions that a dog rids himself of whipworms in five months.

It is also interesting to note that of the seven cases of fits examined, five were heavily infested with worms. Schlotthauer, of the Mayo clinic, lists intestinal parasites as one of the causes of fits. There is an old theory that the worms liberate toxic materials which irritate the intestinal mucosa to cause the fits. While this theory has never been proved or disproved, it is indisputable that worm infestation is an important etiological agent of fits, and that when a case of fits is presented for treatment, a routine examination for worm eggs is indicated.

Prevalence of Infestation

Among the previous studies of the prevalence of worm infestation in dogs are those of Hall (Detroit), Dederick (Ithaca), and Whitney (New Haven). Table II shows their results as compared with mine. Whitney's study was made in 1933; the other two were made about 20 years ago.

Dederick did not look for tapeworms. In my study, some of the diagnoses of tapeworms were based on the finding of the worm segments in the feces, and some on the presence of ova. All the tapeworms were *Dipylidium canium,* the intermediate host of which is the common dog flea.

Whitney reports the presence of pinworms in the cases he examined, although neither Mönnig nor Cameron lists Oxyuris as a parasite of the dog. Apparently, Whitney's report is the only one in the literature reporting the presence of pinworms in dogs. Also, he finds that the whipworm is the most common intestinal parasite, while most of the other investigators find it to be less common.

TABLE II

	Dederick	Hall	Whitney	Erdheim
No. studied	150	102	1000	100
Per Cent Infected	66%	65%	39%	45%
Ascarids	23%	46%	31%	19%
Hookworms	31%	23%	27%	21%
Whipworms	11%		35%	6%
Tapeworms		34%	27%	12%
Coccidia		2%	0.65%	
Pinworms			0.14%	

There are several possible reasons why my results were generally lower than the others. As stated before, Dederick and Hall did their work 20 years ago. Since then dog owners have become "worm conscious", and have been treating their dogs with the various advertised worm remedies, so that the general incidence of infestation might be expected to be lower. Further, my 100 cases include a large percentage of surgical cases (ovariectomies and traumatic injuries), which are, as one would expect, relatively free from parasites.

Effect of Age and Breed

Table III shows the prevalence of the worms in the various age groups.

Although these data are insufficient for

TABLE III

	Under 1 year	1-2 yrs.	2-3 yrs.	3-4 yrs.	4-5 yrs.	Over 5 yrs.
Hookworms	9	4	1	1	3	3
Ascarids	12	3	1	1	1	1
Whipworms	2	1			2	1
Tapeworms	4	2	2	1	1	2
Totals	27	10	4	3	7	7

definite correlations between age and worm infestation, it is indicated that the young dogs harbor more parasites than the older ones. This is in accord with the usual teaching.

With reference to the prevalence of parasitisms in the various breeds, there were too few cases to be able to draw any definite conclusions, although in general it appeared that the different breeds are equally susceptible.

Conclusions

This study indicates that in a relatively high percentage of cases, skin diseases, gastro-intestinal ailments, abscesses, and fits in dogs are associated with intestinal parasitic infestation. The data compiled with respect to the prevalence of various types of parasites differs in some instances from the findings of previous investigators, but this difference appears to be partly due to the dissimilarity in sources of case material, and the only conclusion to be drawn is that in general the incidence of parasitism is decreasing. There is some indication that the incidence of infestation is somewhat higher in young dogs than in old, and that the breed of the dog has no bearing on the matter; but the data in these respects were insufficient to draw definite conclusions.

* * * *

Veterinary Practice in Malta

The Maltese Islands form a group in the Mediterranean Sea, distant about 58 miles from the nearest point in Sicily. Malta is the largest of the islands, with a population of nearly 250,000. Valletta, the capital and commercial and political, as well as naval center, is extremely crowded, with houses and shops, usually combined in one building.

The general veterinary practitioner as such does not exist in Malta because there is not enough scope for him. The veterinarians are, therefore, government employes or pensioners who are allowed to engage in practice. Their work is obviously varied. Thus, in his official capacity, the government veterinarian has the following duties to perform:

1. Administration of the civil abattoirs.
2. Inspection of animals slaughtered for food.
3. Examination of imported meat prior to sale.
4. Post-mortem examinations.
5. The adoption of measures for the control of disease among animals.
6. Examination of all imported animals and of animals for exportation.
7. Periodical inspection of cowsheds and cattle pens, education of farmers in matters of hygiene, and detection of contagious diseases.

In his private capacity the veterinarian is an ordinary general practitioner doing much the same work as veterinarians do elsewhere, including S. P. C. A. work. He builds up his own private practice, which usually includes both local and foreign clients.

The training of veterinarians is carried out at one of the five colleges in the United Kingdom, the course being a five-year one. There are no local veterinary colleges in Malta.

The principal animals with which the veterinarian is concerned are: all food animals, saddle-, draught-, and race-horses, donkeys and mules, milk cows, goats, and sheep.

The types of disease principally encountered are: tetanus, strangles, and influenza in horses; distomatosis, piroplasmosis, tuberculosis (rare), sporadic cases of anthrax, and foot-and-mouth disease in cattle; Brucella infection and foot-and-mouth disease in goats, and fatty degeneration of the liver in pregnant nannies and ewes. The commonest diseases of pigs are hog cholera and swine erysipelas. In dogs the diseases principally encountered are kala azar (Leishmaniasis) and distemper, while in cats gastric influenza (cat enteritis) is of frequent occurrence.

The equipment and instruments used by the veterinarians in Malta are identical with those used in the United Kingdom, whence they are usually imported. There is no local industry manufacturing veterinary instruments.

Pharmaceutical preparations are supplied by the local chemists, but no sera or vaccines are produced locally.

WALTER BUCHLER.

London, England.

Canine Pediatrics

VII. Vitamins and Optimum Nutrition for Artificially-Fed Puppies*

By D. M. CAMPBELL, Chicago, Illinois

A SUBTLE but perceptible evolution now progressing in nutritional concepts carries the potentiality of heretofore undreamed-of dietary standards, to be measured not in the frugal terms of mere "adequacy", but in optimal terms of superior physiological well-being and vitality.

This trend promises revision of many of the more commonplace standards of nutrition to an extent that might at this early point appear revolutionary. Conceivably in human affairs it may affect vital statistics and necessitate revision of insurance life expectancy tables; it may emphasize an already observed trend toward greater average heights; hand-in-hand with progress in medical science and public health, it promises to reduce the incidence of disease by improving resistance and to enhance the qualitative content of individual health through promoting greater zest and vitality.

Almost inevitably it will entail the formulation and compounding of new foods. A mere hint of the possibilities in this direction is exemplified in the almost universally acknowledged value of the fortification of "nature's most nearly perfect food"—milk, through vitamin D irradiation or supplementation—an example of the enhancement by science of Nature's handiwork.

THE question of caloric and gross analytical levels and balances of a dietary already is becoming elemental and no longer offers any particular problems to the biochemist that cannot be dealt with adequately by mathematical equations. Vitamin theory and practice, however, represent a constantly-advancing frontier of the science of nutrition.

Yesterday's vitamin adequacy—enough to avert pathological manifestations of deficiency—has become today's minimum, and today's optimum will be tomorrow's deficiency when measured by the attainable higher standards potential in the newer vitamin concepts.

A CENTURY ago the ox cart and the covered wagon were normal and adequate standards of transportation. The pony express at its inception was the optimum of rapid communication. Bloodletting was a standard and adequate therapeutic practice. The scope of the future of vitamins in nutrition is suggested in recalling that the word itself is scarcely more than a generation old, and that only within a decade have chemists and biophysicists succeeded in obtaining more than elemental knowledge of the nature and functions of the food components called vitamins. The broad significance of the progress which biologists and technicians have made in detection, isolation and synthesis of vitamin entities lies in the potentialities for the utilization of the various factors in building up or synthesizing of the "perfect" or optimum dietary. The scriptural reference to the fact that man shall not live by bread alone becomes applicable to all species in the light of advancing nutritional science, and is being elaborated upon in terms of biochemistry and of organic chemistry by investigators working night and day in hundreds of busy laboratories throughout the civilized world, seeking to define more accurately upon just what the various species may live best. Their findings will chart the course for the optimum nutrition-concepts of tomorrow.

* Prepared in collaboration with Dr. G. C. Supplee and J. H. LeWare, Borden Research Laboratories, Bainbridge, N. Y. This is the 7th of a series of articles on the nutrition of young puppies. The 8th installment of these discussions will appear next month.

Although many vitamin factors have been isolated and identified definitely as chemical entities, and some have been synthesized, probably many more vitamins or groups of vitamins are yet to be identified.

Each of the known vitamin factors has definite characteristics and specific physiological functions; lack or deficiency of each required factor causes characteristic and specific disorder or dysfunctioning. Growth rate is affected markedly by deficiency of any of the vitamins and growth rate furthermore is affected by the relative proportions of each vitamin present.

Probably none of the foods suitable for man or beast is totally devoid of all the vitamin factors, but probably no single food contains all or optimum quantities of the different factors required by man and beast. Hence, by appropriate selection of foods to supply the gross components of the dietary, and knowledge of vitamin deficiencies in such diets, it is possible to supply vitamin concentrates or pure vitamin entities in proper proportions to build the perfect optimum food for a particular species.

ALREADY the view is held by many authorities, and is substantiated by clinical observations and practical feeding experience, that abundance of vitamins in a dietary beyond merely adequate requirements means the difference between passable health and good health. The philosophy of optimum dietary is advocated by some of the outstanding pioneers in the science of nutrition, and is well-established by unassailable evidence, but as yet is not as universally applied in everyday nutrition as it should be; the ultimate potentialities have scarcely been approached outside the laboratory.

The view is held in many well-informed quarters that too often practical concepts of what constitutes adequacy represent mere acceptance of ordinary or usual availability as a suitable standard.

The time is nearing when the predominant biological objective will be, not to determine bare maintenance levels of vitamins for the various species, but to determine the maximum levels and balances of the various factors which can be utilized by the organism for attainment of superior health and well-being. On the basis of well-controlled experiments which have demonstrated that increased levels of various vitamin factors have a mutually-enhancing effect upon the biological values of individual factors, it is not impossible that further research will show that increased intake of one vitamin automatically advances the maximum or optimum capacity or requirement of the individual for other related factors, beyond the original or so-called normal level.

THE significance of this view in the nutrition of very young puppies is illustrated strikingly by the fact that in the formation of a simulated bitch's milk, Borden research workers incorporated 17 times the standard of acceptance of one of the water-soluble vitamins and were able to show that in the presence of liberal levels of other factors this amount was beneficial and of demonstrable value in promoting growth and enhancing the physical condition of growing puppies.

Obviously any formula for the artificial feeding of young pups must supply an abundance of all the factors required by the canine species because of the essential rôle vitamins play in growth of the young, in maintaining the integrity of tissues, and in normal physiological functioning.

VITAMIN A is of great importance in puppy nutrition. The puppy's requirements for this factor are high because of rapid growth and the necessity for maintaining epithelial tissue and mucosa. Lack of vitamin A leads to a stratified, keratinized epithelium which implies loss of local secretion as well as loss of cilia which normally act with the secretions in the expulsion of foreign particles. The normal healthy epithelial tissue of the respiratory tract, and that of the digestive tract, the intestinal mucosa, protect against both mechanical injury and bacterial invasion, acting more or less as a first line of defense. Research workers have suggested that in the undeveloped condition of the intestinal

mucosa of both human infants and puppies at birth, lies the explanation for allergic manifestations resulting from absorption of foreign protein into the blood stream. Certain degrees of vitamin A deficiency present a clinical picture indistinguishable from the later stages of virus distemper.

Although vitamin A has not been synthesized, nor has it been isolated in pure form from natural sources, carotene as the provitamin A has been established firmly as a most valuable means for supplementing deficient diets. The ingestion of carotene, as contained in natural foods or as available in extracted form, becomes for all practical considerations vitamin A within the body where it is converted into the physiologically active factor by the liver.

THE vitamin B complex is made up of a number of chemical entities—four of which have been established definitely to date and isolated in pure form. The physiological importance of the B factors in canine nutrition becomes more apparent daily.

Pure vitamin B_1 has been isolated and synthesized, as has lactoflavin (B_2 or G), and in recent months at least one of the active components of B_6, the anti-acrodynia factor, has been isolated in pure form. Nicotinic acid, further suggested as one of the entities of the original vitamin B complex, has been isolated from natural sources and found to be effective in the alleviation of certain pathological conditions, especially human pellagra and blacktongue in dogs.

Adequate amounts and suitable balance of the entities of the B complex aid greatly in maintaining the appetite and the normal functioning of the digestive processes as well as in retaining and improving normal muscular coördination of artificially fed puppies.

Vitamin B_1 seems to be particularly concerned with the normal motility of the digestive tract. Cowgill, experimenting with dogs, observed, as a result of lack of vitamin B_1, a diminution in vigor of the normal contractions of the stomach, occurring even earlier than loss of appetite. The combined effects of stimulating appetite and of toning of the digestive mechanism, together with the growth-promoting function of B_1, result in acceleration of the growth rate and enhancement of the well-being of the animal.

Cowgill and Gilman also observed a diminution in gastric secretions of dogs starved of B_1, and other investigators believe that B_1 is concerned in carbohydrate metabolism, and that if the vitamin is absent lactic acid is not disposed of normally and accumulates in the body. This view indicates that B_1 shares in a measure with the mineral components of the dietary in the responsibility for maintaining the acid-base balance of the body, discussed in the preceding article in this series.

ALTHOUGH milk is not the richest source of vitamin B_1, experience in feeding human infants has shown that the normal milk-fed baby rarely exhibits evidence of acute deficiency of this factor. However, it has been shown by Gaynor and Dennett that milk for infant feeding to which increased amounts of B_1 were added resulted in increased growth of the infants, improved musculature, and comparative protection from respiratory infections. Other experiments with laboratory animals indicate that the particular balanced relationships between B_1 and other factors contained in milk are such that the nutritive character of the milk as a whole cannot be considered deficient in this vitamin. Nevertheless, there is evidence that supplementing milk with additional B_1 affords more growth or weight gain per unit of B_1—and consequently per unit of milk ingested—than does unsupplemented milk. This indicates a biological interrelationship between dietary constituents and the vitamins, especially vitamin B_1, which affect the rate of growth.

Growth results of such relationships are shown in Charts XIII and XIV. Graph No. 1 of Chart XIII shows the higher rates of growth made by experimental animals per unit of B_1 on a milk diet with a B_1 supplementation. Graph No. 2 in the chart

shows the slower growth rate per unit of B_1 on the unsupplemented milk ration.

The series of graphs shown in Chart XIV illustrates the influence of varying amounts of certain vitamin entities of the B complex in the presence of constant amounts of certain other entities of the same group of accessory factors.

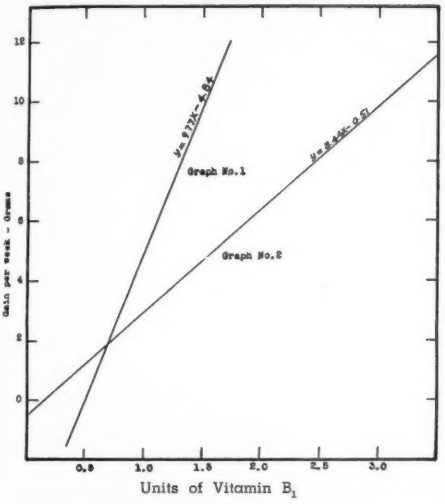


CHART XIII

The two graphs in this chart demonstrate the mutual enhancement of the growth-promoting properties of vitamin B_1 and milk. Graph No. 1 shows the growth rate of experimental animals fed milk supplemented with B_1. Growth rates on unsupplemented milk are shown in Graph No. 2

THERE is evidence of a definite relationship between the normal food intake of an animal and its minimal vitamin B_1 requirement. Cowgill, in his investigations of vitamin B_1 requirements of various species, including man and the dog, demonstrated that the body weight of the individual, and the maximum normal weight of the species are two important variables determining the B_1 minima. Cowgill reduced these relationships for the various species to mathematical formulæ and to graphs which showed straight-line relationships between body weight and the vitamin-calory ratio for each of the several species studied.

Since an animal normally governs its food intake by its energy needs, it is apparent that the value of a ration in terms of vitamin B_1 depends upon the vitamin-calory ratio and that because of the demonstrated effect of B_1 upon appetite, any uncorrected B_1 deficiency tends to lead to inanition, simultaneously perpetuating the vitamin deficiency.

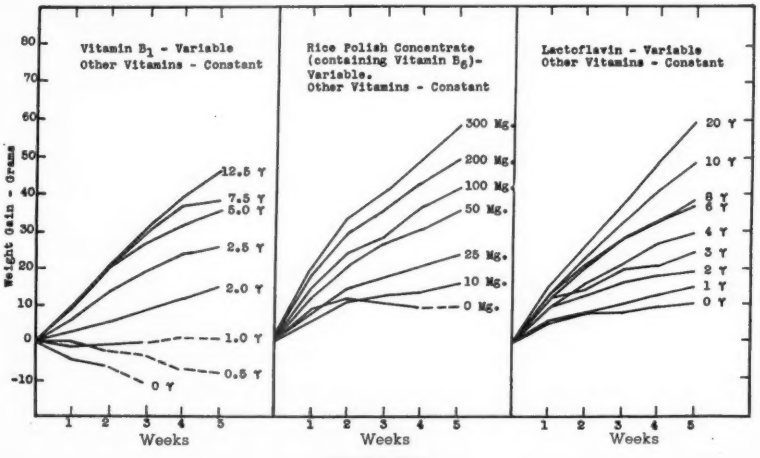


CHART XIV

These graphs show the interdependent relationships of the water-soluble vitamins as reflected in growth results from various amounts and ratios of three of the factors—B_1, B_6, and lactoflavin. In each case the amounts of two of the factors were constant and the third factor was varied. The absence of any single factor completely voided the effectiveness of all of the other factors, as demonstrated by the negative results when the variable factor was at zero

BEYOND its recognized growth function the status and functions of lactoflavin in nutrition are known only superficially. However, there is no doubt that all living animal tissue requires lactoflavin for internal respiration and proper cell functioning; apparently lactoflavin performs a function in the oxidation-reduction phenomena of cell metabolism.

Lactoflavin has a three-fold physiological destiny. It is utilized, stored and secreted. It is stored in the body to a certain extent irrespective of the amount ingested and the amount required for maintaining growth, and irrespective of the growth rate. Lactoflavin also is excreted in amounts which appear to be at least indirectly correlated with intake, with the amount required for maintaining a given rate of growth, and with the amount which is stored. In brief, there appears to be a constantly-shifting optimum threshold or saturation level of lactoflavin, the exact concentration being determined by maintenance and growth requirements. Notwithstanding this evidence of an equilibrated relationship among the amounts of lactoflavin ingested, secreted and stored, recent investigations in the Borden laboratories indicate that within inherent limitations the growth rate is commensurate with the lactoflavin supplied in the dietary, irrespective of the form in which it is ingested. However, there is evidence that of the various forms of lactoflavin present in different materials, certain forms appear to be biologically more potent, more readily utilized, and more effective in promoting growth than others.

Granting that lactoflavin performs an essential function in the respiration of each individual cell, it is an inevitable implication that the lactoflavin requirements of an individual organism are determined by the total number of individual cells in the body and by the activity or respiration rate of the cells. It is conceivable that with sufficient data the science of biometry could, in theory at least, state this relationship in the form of a mathematical equation. It follows also that growth, which involves an increase in the total number of cells, and vitality, which implies high cell activity or high cell respiration rate, necessarily would be reduced or inhibited by shortage of lactoflavin, and conversely would be facilitated, if not actually stimulated, by abundance of available lactoflavin.

Recent literature (Sherman) indicates that continued high levels of lactoflavin intake are conducive to greater longevity and to the retention of full capacity of functioning in various metabolic processes and vital organs. This may be a result of improved oxidation-reduction.

Obviously, abundant lactoflavin is of primary importance in an artificial feeding formula for puppies, since its presence is required for maintenance of animal life and for growth. Bitch's milk has been found to contain somewhat over 6γ per cubic centimeter of lactoflavin, or more than twice that contained in cow's milk. However, when the lactoflavin contents of the two milks are compared on the dry solid basis, this factor occurs in about the same degree of concentration in both milks.

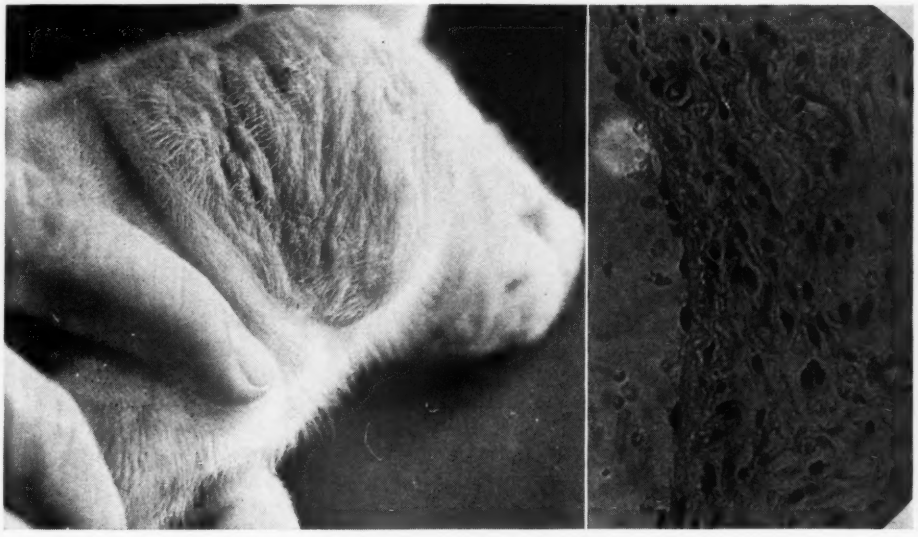
Extreme deficiencies of lactoflavin have produced death in dogs. Experimental animals suffered "yellow liver" condition when deprived of lactoflavin, U. S. Public Health Service investigators founds.

VITAMIN D, intimately associated with mineral metabolism, is required by puppies to prevent rickets. Although sunlight might be expected to supplement the antirachitic activities of the normal vitamin D content of bitch's milk, the same influences of contemporary life which have made vitamin D supplementation of the human infant's dietary necessary, also indicate the advisability of supplying young puppies, particularly those fed artificially, with more than minimal levels of the antirachitic vitamin. In the formulation of simulated bitch's milk for these experiments, an ample excess of vitamin D for all body requirements, was provided, discounting entirely any benefit which might be derived in this particular regard from sunlight. Vitamin D in itself, however, offers no sure protection against failure of the bones to calcify properly unless adequate amounts of calcium and phosphorus,

in biologically suitable forms, and in properly balanced ratios, are provided simultaneously. The antirachitic value of a simulated bitch's milk, then, depends upon a delicate integration of these several factors. A vast background of research data obtained in the study of the etiology and correction of rickets in human infants greatly facilitated the compounding of simulated bitch's milk to provide adequately for the vitamin D requirements of growing puppies.

BROADLY speaking, there are no precision methods of determining the normal minimum vitamin requirements of an animal or a species comparable with respiration techniques for determining caloric requirements, or balanced experiments on restricted intakes for determining requirements for protein and mineral elements. Generally, optimal vitamin intake standards are far above minimal needs, and clinical and practical feeding experiences confirm the fact that pursuance of this principle in the compounding of an artificial feeding formula for very young puppies is in the best interests of the animal's nutrition.

As a practical consideration in canine pediatrics, the entire vitamin problem may be simplified by the practitioner by using only products which embody the concept of optimum vitamin intake in contradistinction to the adequate minimum standard.



PRENATAL NEOPLASM

One of a litter of 14 Chester White pigs born March 4, 1938, was found to have a growth on the right side of its neck just behind the ear (Fig. 1). The mother refused to suckle it, and although artificially fed, it died March 6.

The pig was brought to the veterinary clinic of Kansas State College March 8, 1938, for post-mortem examination. Macroscopically, the typical tissue showed caverns filled with blood and serum, and had the appearance of multiple hemotomas. The vessels in the involved region and in the corresponding axillary region were severely congested. The lymph nodes surrounding the area were increased in size and number, and were involved in the same manner as the typical tissue, indicating metastasis. The liver and the mesenteric blood vessels were congested.

Microscopical slides of the typical tissue and of the involved lymph nodes (Fig. 2), prepared by Dr. C. C. Morrill, of the Kansas State College, showed the growths to be typical cavernous hemangioendotheliomas.—C. F. SHELBY, Joplin, Mo.

Book Reviews

MANUAL OF VETERINARY BACTERIOLOGY. By Raymond A. Kelser, D.V.M., A.M., Ph.D., Lieut. Colonel, Veterinary Corps, United States Army; Chief, Veterinary Division, Surgeon General's Office, War Department, Washington, D. C. Third edition. Cloth bound. 640 pages. 93 illustrations. The Williams & Wilkins Co., Baltimore, 1938. $6.00.

Since the appearance of the first edition of this work in 1927, it has completely dominated its field among American text books. Under such circumstances, veterinarians and veterinary students should be particularly grateful to the author and the publisher for bringing out, as they have, new editions whenever the advances in bacteriology and related subjects justify a revision of the text.

Previous editions of this work have been reviewed in these pages (1st ed. in Vol. XXII, No. 9, p. 354, Sept. 1927; 2nd ed. in Vol. XXVIII, No. 12, p. 517, Dec. 1933) and to these reviews the reader is referred for a detailed description of the work.

It suffices to say here that the revised text incorporates invaluable information developed by the vast amount of research of recent years in the fields of bacteriology and immunology, the additions to the text on the latter subject being particularly noteworthy.

* * * *

VETERINARY PATHOLOGY AND BACTERIOLOGY. By S. H. Gaiger, F.R.C.V.S., Late Professor of Veterinary Pathology, University of Liverpool, Liverpool, England, and Gwilym O. Davies, M.V.Sc., M.R.C.V.S., D.V.H., Lecturer in Veterinary Pathology, University of Liverpool, Liverpool, England. Second edition. Cloth bound. 712 pages. 198 illustrations. Alexander Eger, Chicago, 1938. $6.50.

The first edition of this work was reviewed in these pages in December 1932, to which review the reader is referred for details.

Of the present edition, *The Veterinary Record* recently stated, in part: "The second edition of Gaiger and Davies' Veterinary Pathology and Bacteriology will receive a wide welcome. Professor Gaiger's lamented death so soon after the appearance of the first edition laid a great responsibility on his co-editor. . . . . .

"This is essentially a text-book for students of veterinary science and in its composition descriptions have been simplified and condensed in order to make room for the essential matter while retaining a book of handy size.

"The book contains an enormous mass of information on subjects that are not dealt with suitably in other similar publications in the English language and can fairly be claimed to have fulfilled the purposes for which it was written. . . . . .

"The general arrangement of the text follows closely that of the first edition [*Vet. Med.* Vol. XXVII, No. 12, p. 545], but there are many additions necessitated by the developments in the subjects during the last half decade.

* * * *

A TEXT-BOOK OF THE DISEASES OF THE SMALL DOMESTIC ANIMALS. By Oscar Victor Brumley, V.S., Dean of the College of Veterinary Medicine and Professor of Veterinary Medicine, The Ohio State University, Columbus, Ohio. Third edition. Cloth bound. 597 pages. Lea & Febiger, Philadelphia, 1938. $4.75.

This work was extensively reviewed on the appearance of the second edition only six years ago. (*Vet. Med.*, Vol. XXVII, No. 3, p. 132, March 1932), to which review the reader is referred.

Quoting from the preface: "This book is intended to be a practical text for student use and a guide for the busy practitioner on the diseases of small domestic animals. For this reason the author feels that it is inadvisable to write an exhaustive treatise on the subject, but rather to include all of the important diseases (medical and surgical) in a brief, yet concise form, so that the student and the practitioner will have the important facts available for use. . . .

"Many changes have been made where necessary in order to bring the text up to date. Some subjects have been almost entirely rewritten, others have been changed to conform to present knowledge. Practically all reference relative to diseases of fowls has been eliminated."

DIAGNOSIS OF PARASITES IN ANIMALS. By Dr. R. E. Rebrassier, Department of Veterinary Parasitology, College of Veterinary Medicine, The Ohio State University, Columbus, Ohio. Paper bound. 65 pages. 123 illustrations. The Ohio State University Press, Columbus, Ohio, 1938. $1.00.

This is essentially a manual for use in connection with the identification of parasites of domestic animals and of parasite eggs in fecal examinations. The booklet begins with five pages of printed instructions, which is followed by 60 pages of halftones of parasites and parasite eggs, together with schematic illustrations of the life cycle of economically important parasites.

* * * *

BIG FLEAS HAVE LITTLE FLEAS, or Who's Who Among the Protozoa. By Robert Hegner, Professor of Protozoölogy in the School of Hygiene and Public Health, Johns Hopkins University. Based on Messenger Lectures, Cornell University, 1937. Cloth bound. 285 pages. Illustrated. The Williams & Wilkins Company, Baltimore, 1938. $3.00.

> "Big fleas have little fleas
> Upon their backs to bite 'em,
> And little fleas have lesser fleas
> And so *ad infinitum.*"

This bit of philosophical doggerel, from which Doctor Hegner draws his title, is indicative of both the scope and the style of the book, which deals with the "lesser fleas"—the protozoa — in an informal manner.

There is a widespread notion that so-called "popular" works on scientific subjects are necessarily inaccurate from an academic viewpoint; that humor and simplicity are irrevocably incompatible with scientific truth. This book is a notable refutation of such an idea. Entertainingly written in language understandable by any educated layman, liberally sprinkled with bits of verse and with humorously-conceived line drawings, it is nonetheless scientifically sound in its presentation of the basic facts concerning the commoner protozoa of men and (to a lesser extent) of animals.

The whole field of protozoölogy is reviewed, and the life, habits, and methods of control of the more important protozoan parasites of man are covered in some detail. The chapter dealing with malaria is particularly illuminating. Not the least interesting sections of the book are those discussing the history of protozoölogy and describing a field expedition to the Philippines.

The book should be of value to students beginning the study of protozoölogy; and it is certain to furnish entertainment and, in most cases, instruction, to lay readers and professional men alike.

* * * *

PARASITOLOGY with Special Reference to Man and Domesticated Animals. By Robert Hegner, Ph.D., Professor of Protozoölogy, The Johns Hopkins University; Francis M. Root, Ph.D., Late Associate Professor of Medical Entomology, The Johns Hopkins University; Donald L. Augustine, Sc.D., Assistant Professor of Helminthology, Harvard University, and Clay G. Huff, Sc.D., University of Chicago. 812 pages with index. Profusely illustrated. Cloth. D. Appleton-Century Co., New York, 1938. $7.00.

This is a general revision of "Animal Parasitology" published in 1929. According to the authors each of the fifty-three chapters has been carefully revised "to include the results of additions to our knowledge that have been made during the past nine years".

The book is divided into an introduction and three sections. The introduction and section one on "Protozoölogy" were prepared by the senior author. Section two: "Helminthology" by Donald L. Augustine and section three: "Arthropods of Parasitological Importance" is the work of the late Francis M. Root revised by Clay G. Huff.

It reviews the development and present state of knowledge concerning human and animal diseases transmitted by parasites. It covers thoroughly and authoritatively the identification of species, life cycles, cultivation, morphology, pathogenicity and emphasizes the dangers of transmission from animals to man and *vice versa* of all species.

As one would expect the clinical diagnosis and the specific treatment of the diseases attributed to parasites receive but little consideration. Nevertheless this work

will long be a useful source of information in its field.

Many new species are described and established in birds, mammals, reptiles and amphibia. Much new information regarding life cycles of common parasites is recorded.

The authors express a hope that this textbook will be of use to veterinarians and practising physicians. This reviewer feels that the wealth of material assembled in this work is of *definite value* to both veterinarian and physician, as it is, by far, the most comprehensive discussion of parasites and parasitism available to date.

If from every book just one thing can be learned that book deserves a second reading. Many small animal practitioners perhaps will have the danger to the host more greatly impressed upon them by the following excerpt: "From direct observation it has been noted that 100 dog hookworms remove about 84cc of blood from the host in 24 hours. Only an infinitesimal portion of this amount is used as food by the parasites".

Seventy-eight pages are devoted to an extensive bibliography. These references are a handy source to the reader who wishes more detailed material for further study. This work is recommended without reservations to the practitioner and the student as a most valuable reference for the study of parasitology.—*H. J. Mostyn.*

* * * *

YOUR PUPPY AND HOW TO TRAIN HIM by H. V. Beamish. Cloth. Price $2. Pp. 206, with 27 illustrations, New York: Lee Furman.

Twenty years of breeding and training qualify Miss Beamish for her subject, and in the first 15 chapters on training dogs and "dog manners" she is on familiar ground. It is not a sentimental dog book, which may be attributed to the fact that this author strips the glamour from any belief that a dog possesses intelligence.

If the author did not detour from her subject of training and trespass into the realm of what to do in the care of the dog in sickness, this book could be recommended by small animal practitioners to their clients without reservation.

Chapters XVI and XVII could be eliminated from this work to advantage. Canine hysteria, with all the lay beliefs as to its cause and prevention, is reviewed by the author. In fairness, however, she does not support any of these beliefs with her own opinion. She conjurs a guess—heredity.

In case of mismating, douching the bitch with a "strongly mixed disinfectant" 'Dettol' is recommended. For general worming, "oil of male fern" an "excellent and harmless vermifuge" is endorsed for twice yearly routine use. "The ratio of sex in the litter is the sire's contribution" and other absurdities blaze her trail through the unknown.

Had the manuscript for this work, which was first published in England, been reviewed by a veterinarian prior to publication its acceptance would have been much wider.—*H. J. Mostyn.*

* * * *

THE GREAT DANE. By D. E. Hale, International Dog and Poultry Judge. Second Edition. Cloth bound. 112 pages. Profusely illustrated. Judy Publishing Co., Chicago, 1938. $2.50.

This little book (it is largely pictures) will no doubt prove interesting and instructive to breeders and other owners of the breed, for it presents the desirable characteristics of the Great Dane with all the glamor of which a partizan imagination is capable; opposite qualities, if any, are not mentioned. A discussion of the breed standards is also included, and some hints on breeding, feeding, care and training.

* * * *

Although originally termed the "antirachitic factor," vitamin D is now known to play an important part in many physiological processes other than those involved in the calcification of bony structures. A deficiency of vitamin D has been found associated with decreased energy metabolism, reduced tone of skeletal muscles, lowered motility of the gastrointestinal tract, delayed onset of puberty and pathological overactivity of the parathyroid glands. Moreover, large doses of vitamin D have been found effective in the treatment of a wide variety of pathological conditions. —*Vitamin D Milk*, 5:7, p. 28.

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Army Veterinary Service

Captain Wm. E. Jennings is detailed as a student under the provisions of Sec. 127a National Defense Act, as amended, and directed to proceed to Lexington, Ky., for temporary duty for a period of approximately five months, effective on or about January 1, 1938, for the purpose of pursuing a course of instruction in the science of breeding and clinics under Dr. Dimock at the University of Kentucky; upon completion to return to his proper station, Washington, D. C. Captain Jennings is also directed to report in person to the officer in charge of the Lexington Remount Area, Lexington, Ky., for additional duty.

First Lieut. Edwin L. Millenbruck, Army Medical Center, Washington, D. C., is directed to proceed to Carlisle Barracks, Pa., and report to the Commandant, Medical Field Service School, on or about January 1, 1938, for temporary duty for a period of approximately five months, for the purpose of pursuing the basic course of instruction.

Captain Robert A. Boyce, Jr., is directed to proceed at the proper time from Washington, D. C., to Fort George G. Meade, Md., and report on or about January 3, 1938, to the commanding officer for temporary duty for a period of approximately five months; upon completion of this duty to return to his proper station.

First Lieut. Fred L. Herring is relieved from further assignment and duty at the United States Military Academy, West Point, N. Y., is assigned to duty at the Medical Field Service School, Carlisle Barracks, Pa., and will proceed to Carlisle Barracks, Pa., and report, on or about January 1, 1938, to the commandant, Medical Field Service School, for duty for the purpose of pursuing the basic course of instruction.

Captain James B. Nichols is relieved from duty at Fort Myer, Va., and assigned to the San Francisco port of embarkation, Fort Mason, Calif., and will proceed at the proper time to New York, N. Y., and sail on the transport scheduled to leave that port on or about November 27, 1937, for San Francisco, Calif.; upon arrival in San Francisco will report to the commanding general, San Francisco port of embarkation, for duty.

Lt. Col. Francois H. K. Reynolds is relieved from his present duties in the Panama Canal Department and is assigned to duty with the Medical Department Research Board, effective upon the relief of Lt. Col. Raymond A. Kelser. Lt. Col. Reynolds will report to the commanding general, Panama Canal Department, for duty accordingly and to the Governor, the Panama Canal Department, for additional duty with the research board.

The promotion of Major George J. Rife to the grade of lieutenant colonel with rank from November 27, 1937, is announced.

The promotion of First Lieut. Albert A. Roby, Jr., to the grade of captain, with rank from November 17, 1937, is announced.

The following-named veterinary officers of the National Guard have been enrolled in the Forage Inspection Course at the Army Veterinary School, Army Medical Center, Washington, D. C., beginning November 29, 1937.

Captain Hubert H. Harz, V. C., 122nd F. A., Illinois N. G.

Captain Walter W. Arzberger, V. C., Wisconsin N. G.

Captain Robert S. MacKellar, V. C., 101st Cav., New York N. G.

Captain William M. Lukens, V. C., 112th F. A., New Jersey N. G.

First Lieut. Thomas A. Ward, V. C., 124th Cav., Texas N. G.

Lt. Col. Raymond A. Kelser is assigned to duty in the office of the Surgeon General, Washington, D. C., effective upon completion of his present tour of foreign service in the Panama Canal Department.

Captain Clarence L. Taylor is relieved from assignment and duty at the Army Medical Center, Washington, D. C., effective upon completion of his course of instruction at the Army Veterinary School, on or about January 1, 1938, and assigned to Fort Myer, Va., for duty.

Captain Wayne O. Kester is relieved from assignment and duty at the Army Medical Center, Washington, D. C., and will proceed to Seattle for duty.

Veterinary Corps Reserve

New acceptances—Pinckard, Wendell Lamar, First Lieut., 312 Church St., Knoxville, Tenn.; Reneau, John Bryant Jr., First Lieut., Munday, Texas.

Promotions—Davidson, J. LaVere, to Capt., 2226 Oakland Drive, Kalamazoo, Mich.; Todd, Frank Arnold, to Capt., 98 Park St., New Haven, Conn.; Brillhart, Carl Edgar, to First Lieut., 722 State Office Bldg., Lansing, Mich.; Mencimer, Floyd Robert, to First Lieut., 4100 Riverdale Road, Ogden, Utah.

New assignments to active duty with CCC—Parker, R. M., First Lieut., Ft. Moultrie, S. C.; Theopilus, D. K., First Lieut., Hq. Fourth Corps Area; Fry, Lloyd Vern, First Lieut., Ft. Snelling, Minn.; Willard, Horace Randolph, First Lieut., North Texas Dist. CCC, Ft. Worth, Tex.

Termination of assignment to active duty with CCC—Greene, James E., First Lieut., Ft. McPherson, Ga.; McNay, Garrett H., First Lieut., Ft. Moultrie, S. C.; Yost, Hursh R., Capt., Ft. Knox Dist., Ft. Knox, Ky.; Scheetz, George F., First Lieut., Charleston Dist., Charleston, W. Va.; Reineccius, Jake Louis, First Lieut., Ft. Des Moines, Ia.; Nieberding, Joseph F., First Lieut., North Texas Dist. CCC, Ft. Worth, Tex.; Asbill, Stephen G., First Lieut., Sacramento, Calif.; Bolenbaker, R. F., Capt., Fresno, Calif.; Bolender, Fred J., First Lieut., Ft. Missoula, Mont.; Hensley, John H., First Lieut., Boise, Idaho; Mace, Don L., First Lieut., Redding, Calif.; Morgan, Donald R., First Lieut., Vancouver, Wash.

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The United States Department of Agriculture withdrew Federal quarantine December 1, 1937, from 9,287 square miles of territory in Florida and Texas. The effect of this is to release from quarantine one county in Florida and five counties in Texas. Parts of three counties in Florida, including 2,248 square miles, were requarantined.

The area under Federal quarantine on July 1, 1906, amounted to 728,565 square miles. The net area released by the order on December 1, 1937, amounted to 7,039 square miles; making a total of 703,173 square miles released since 1906 and leaving 25,392 square miles in quarantine, all located in Florida and Texas.

The requarantine of territory in Florida became necessary in a few swampy areas in central Florida because deer were responsible for perpetuating the ticks found on the cattle in these sections.

It will be necessary to remove a large proportion of the deer in these swampy areas before tick eradication can be completed. Until this is done there will be a constant danger of the tick spreading to clean areas. The ranges involved are relatively small and once the tick is eliminated such areas will be more healthy for the deer as well as for the cattle and restocking with deer will proceed rapidly.

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Veterinary Professor Passes Away

H. F. Lienhardt, 43, professor of Pathology, and Head of the Department of Pathology in the Division of Veterinary Medicine, Kansas State College, died November 11, 1937, after a lingering illness.

Doctor Lienhardt was graduated by the University of Pennsylvania in 1916 and pursued graduate work there and in Kansas State College. He joined the staff of the Department of Bacteriology in Kansas State College as Instructor in 1917. In 1919 he transferred to the Department of Pathology in the Division of Veterinary Medicine as Assistant Professor. In 1920 he became Professor of Pathology and Head of the Department.

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Doctor Lienhardt served as a Lieutenant in the Veterinary Corps during the World War in both France and Germany. He is survived by his widow, three daughters, and a sister.

Death of Veterinarians

Ross T. Hansen, 63, Weston, Iowa, died of heart disease October 18th; Emil H. Pohl, 75, Buffalo, N. Y., died Oct. 24th after an illness of two years; Mathew Baber, 48, Roann, Ind., died of injuries sustained in an automobile collision, October 29th; Christian Rothang, 64, Sea Cliff, L. I., died Nov. 3rd; William Edward Adams, 74, Carson City, Mich., died Nov. 7th; George Ireland, Victoria, Tex., died Nov. 16th; H. M. Lint, 74, St. Joseph, Mo., died Nov. 20th; R. A. Moye, 48, Manchester, Ia., died by his own hand, Nov. 23, 1937.

Vitamin Display at Chicago Show

Visitors at the Western Specialty Clubs' Association [Dog] Show held at the Coliseum, Chicago in November saw how vitamins are counted by light. This was the feature of the Ken-L-Ration display. A 33-inch drum decorated as a can of Ken-L-Ration arranged on a platform. Inside this drum was a glass bowl containing vitamin impregnated water. By means of alternating between black light and regular light, the vitamins become visible in the water—casting off a deep blue coloring.

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Colonel Robert J. Foster, U. S. army veterinarian, turned professor for a day November 1st, when he discussed the work of the veterinary corps in inspecting Quartermaster supplies before the students of the Quartermaster school in Philadelphia.

Dog Stamps

Honoring a national hero by picturing his likeness on postage stamps is an old tradition. For the dog, though frequently acclaimed popular hero, such official recognition has been meager. Only six times in history has the likeness of a dog appeared on a stamp; four have been of Newfoundlands.

In 1887 the one-half cent stamp of Newfoundland bore the reproduction of a head of the national breed. Newfoundland repeated in 1932, this time with a full-length portrait.

The islands of St. Pierre and Miquelon followed suit in 1933. Again the Newfoundland was honored.

When Canada celebrated her 60th birthday anniversary as a Dominion, in 1927, she included a picture of a team of sled dogs in an issue of special delivery stamps; dog teams are used in mail transport.

The then French possession, the Saar, in 1926 issued a 40-centime stamp portraying a blind man being led by an Alsatian, or German shepherd dog.—*The Dog Bulletin.*

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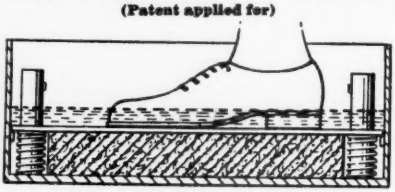
WEEN
A Liquid Food For
PUPPIES

Ketchum Foot Disinfector
(Patent applied for)



A portable box, filled with liquid disinfectant for cleaning footwear to prevent carrying germs into Barns, Poultry Houses, Etc.

When foot is placed on perforated plate inside box, the disinfectant flows up, out of the sponge like filler beneath, around the footwear.

Made of all rust proof metal with a tight cover and convenient handle for carrying and may be transported without spilling or splashing.

Price:

East of the Mississippi,	*$5.50, delivered*
West of the Mississippi,	*6.00, delivered*
West of the Rockies,	*6.50, delivered*

KETCHUM MFG. CO.
DEPT. A. LUZERNE, N. Y.

A. P. H. Association

The 66th annual meeting of the American Public Health Association, held October 5-8, in New York City, registered a larger number of delegates than any preceding meeting in the Association's history. The total count was 3549. The next highest registration was at Chicago in 1928, when slightly more than 2500 were registered.

At the New York City meeting, every state in the Union was represented, Canada, Cuba, Mexico, Puerto Rico, Alaska, Hawaii, Philippine Islands, England, Germany, France, Belgium, Japan, Switzerland, India, Finland, Holland, Turkey, Ireland.

Every meeting of the heavy schedule of scientific sessions was exceptionally well attended. Two meetings to which the public was invited, held in the Manhattan Opera House, filled the Auditorium.

Both technical and scientific exhibits were so consistently good, the Governing Council memorialized them in a resolution of commendation.

A number of important resolutions were adopted.

The Backus Dog Crate
Write for Catalogue of
OUR NEW LOW PRICED
DOG CRATES AND BEDS
A. BACKUS JR. & SONS 1498 W. FORT ST. DETROIT - MICH.

Periostine

Horse Back To Work in Three To Five Days

It is a powerful antidote to inflammation occurring in the periosteum, articulations, bursæ, tendons, ligaments; also where there is pain, exostosis or lameness. Usually only one application is necessary. One bottle is sufficient to treat three or more cases.

Endorsed by almost every veterinarian that has given it a trial.

FREE Booklet—"Reminders in Diagnosing Obscure Lameness."

Price per bottle..$2.00
Three bottles 5.00

Free Sample. To Every Veterinarian that has not received a sample, we will gladly send postpaid a liberal sample upon request. No obligation.

DETROIT VETERINARY SUPPLY CO.
Detroit, Michigan
Canadian Branch, Windsor, Ontario

Advertise Meat!

Millions of dollars are being spent annually by food associations to advertise oranges, grapefruit, lettuce, pineapples, and many other food products. This means keener competition for meat than ever before. We of the live stock and meat industry cannot afford to sit on the sidelines. In meat we have a food unsurpassed in building rich, red blood and strong sturdy bodies. *If we do not advertise these facts to consumers of the entire United States, no one is going to do this for us.*

How Is the Board's Meat Promotion Program Financed?

The Board's program is financed by small voluntary contributions from live stock growers and packers.

Collections from growers or shippers are made at the time the live stock is sold. The packer who buys the live stock matches the contribution from the grower or shipper.

Contributions from growers or shippers amount to approximately 25c per single-deck car, and are made on the following basis:

Cattle	1c per head
Hogs	1/3c per head
Calves	1/3c per head
Sheep	1/5c per head

What Food Producers Spend to Advertise Their Products

Maine Potatoes	$ 2.05	Per Car
Idaho Potatoes	3.60	" "
Florida Oranges	4.62	" "
Washington Apples	7.50	" "
Florida Grapefruit	15.00	" "
Florida Tangerines	23.10	" "
California Oranges	23.10	" "
California Lemons	40.60	" "
Live Stock	25c	per car

It will be noted from the above figures that other food interests are contributing a great deal more per car for the promotion of their products than is being contributed by live stock growers for the promotion of meat.—*Nat'l Live Stock and Meat Board.*

Patton Biological Laboratories

Formulas - Consultation
Biological Testing
ALL ANIMAL FEEDS

●

Address all correspondence to
DR. J. W. PATTON
P. O. Box 591 **E. Lansing, Mich.**

Fistone First

Thousands of unsolicited letters in our files testify to the efficacy of this supreme antisuppurant.

Fistula of the Withers, Poll Evil, Quittor, Nasal Gleet, Chronic Metritis, Catarrhal Endometritis and other localized Pyogenic ailments of domestic animals have been successfully treated with Fistone by thousands of practising Veterinarians in the United States, Canada and England.

The universal success of Fistone in the cases of Fistulous wounds of horses and cattle has called forth a host of imitations, but only the genuine invites rigid investigation.

85% of Fistulous cases respond to Fistone! Ask Us!

COUPON

The Fistone and Appliance Company, College Corner, Ohio.

Enclosed please find check for $8.00, for which send me one dozen 12-ounce boxes of Fistone (trial order) once only. (Regular price $10.) One-half dozen boxes $5.00.

Dr. .....

Address .....

Classified Advertisements

For Sale, Wanted, etc., $2.00 for 25 words or less; additional words, 8 cents. 25 cents extra when replies are sent in care of VETERINARY MEDICINE.

JUDY'S DOG ENCYCLOPEDIA, 2nd ed.; all dog subjects, $5.00 cash or C. O. D. Can furnish any dog book. Dog World subscriptions $2.00 for one year; five years, $5.00. JUDY PUBLISHING COMPANY, 3323 Michigan Blvd., Chicago.

VETERINARY PRACTICES, physicians, etc., furnished; also assistants, etc. Practices handled for sale. F. V. Kniest, 1537 S. 29th St., Omaha, Nebr. Established 1904.

NEW BOOK ON HORSESHOEING, containing 164 cuts of shoes, with full description of each shoe. The most valuable information to veterinarians. $1.00, postpaid. Henry Asmus, New York State Veterinary College, Ithaca, N. Y.

PRACTICE OF VETERINARY MEDICINE, Udall. Second Edition. $5.00 prepaid. D. H. Udall, New York State Veterinary College, Ithaca, N. Y.

ASSISTANT WANTED: General practice, near New York City. Single man, to live on premises. Address No. 187, care of VETERINARY MEDICINE.

WANTED: Experienced veterinarian desires position as assistant. Address No. 189, care of VETERINARY MEDICINE.

FOR SALE: Excellent location in Northern Iowa. Modern home and small hospital. Unopposed territory; good roads; collections good. Sacrifice price; terms. Best reasons for selling. Address No. 190, care of VETERINARY MEDICINE.

An Opening for an Assistant Veterinarian in Small Animal Hospital near Chicago. Living Quarters Furnished. Address No. 192, care of VETERINARY MEDICINE.

FOR SALE: Two registered Dalmations, one a female, born in 1931, imported, has been shown and is an excellent brood bitch; the other, a male, born February 1936, proven sire and will show well. Address No. 193, care of VETERINARY MEDICINE.

MIXED PRACTICE FOR SALE: Practice in Milford Delaware (population 5,000); close to large summer resorts; good small animal possibilities. Nearest competitor, 20 miles north. Price very reasonable. Write to or call on Dr. Herbert G. Wohnsiedler, Milford, Delaware.

FOR SALE: Hollywood, California small animal practice and complete hospital equipment for sale in Spring. Low rental, established 1922. Owner retiring. Dr. R. M. Scott, 612 N. Western Ave., Los Angeles, Calif.

FOR SALE: Small animal hospital and practice in Savannah, Ga. Good location and good future for energetic man. Other interests reason for selling. Address No. 195, care of VETERINARY MEDICINE.

FOR SALE: Large and small animal hospital, completely equipped, located in the sunny South. Established practice for 30 years. Priced for quick sale. Owner has other business interests that require all his time. Address No. 196, care of VETERINARY MEDICINE.

WANTED: Position with general practitioner. Young veterinarian who has conducted own practice for past ten years, mostly small animals, wishes to work with veterinarian with first class horse and cow practice. No big salary expected. Plenty of energy. New York State preferred. Address No. 197, care of VETERINARY MEDICINE.

WANTED: An assistantship by a young graduate veterinarian. Single. Experienced. Willing to work. Good references. Address No. 198, care of VETERINARY MEDICINE.

FINE SADDLE HORSES? Full reports of all shows? Beautiful horse pictures? Advice on his training? Complete saddle horse news for only $3.00 per year, (12 beautiful magazines). The National Horseman, 512 Fourth St., Louisville, Ky.

May we send you **FREE** *the new*
SQUIBB VETERINARY HANDBOOK ?

and Price List; describing in detail almost 200 Veterinary Specialties; in many cases with indications and recommended dosages; quoting regular veterinary hospital discount prices.

E. R. SQUIBB & SONS, 745 FIFTH AVENUE, NEW YORK
Veterinary and Animal Feeding Products Division

GUARANTEED TO GIVE SATISFACTION

M·A·C

ACCEPTED AND USED BY THE PROFESSION SINCE 1900

In the treatment of Splints, Spavins, Sidebones, Curbs, Inflamed Tendons, Bursal Lameness, etc.

"M. A. C. HAS NEVER BEEN SUCCESSFULLY IMITATED"

CARTER-LUFF CHEMICAL CO., HUDSON, N.Y.

PRICES

SINGLE BOTTLE	$ 2.00
¼ DOZEN 1 BOTTLE FREE	5.00
½ DOZEN 2 BOTTLES FREE	8.00
1 DOZEN 4 BOTTLES FREE	15.00
2 DOZEN 4 BOTTLES FREE	25.00

FOR PRICES IN CANADA write to
Wingate Chemical Co.
Montreal

AGENTS SOUTHERN STATES
Kentucky Serum Co.
LOUISVILLE, KY.

Doctor Hell Victim of Heart Attack

Henry Hell

Henry Hell, 60, Wilton Junction, Iowa, died suddenly of heart disease, December 17, 1937. Doctor Hell was graduated from the School of Veterinary Medicine, University of Pennsylvania in 1904 and immediately began practice at New Liberty, Iowa. After 15 years, he moved to Wilton Junction, where he continued in practice up until the time of his unexpected death.

Doctor Hell has long been prominent in veterinary circles in Iowa and in the A. V. M. A. He was a former president of the Iowa State Veterinary Medical Association and the principal organizer of the Eastern Iowa Veteterinary Association, of which he was the first president, serving three years. Doctor Hell was founder of the publicity program of the Eastern Iowa association, which was begun in 1925 and continued ever since. This publicity program has been the most successful undertaken by any veterinary organization and has been a model for such work in many other veterinary associations. He was originator of the motto of the Eastern Iowa Veterinary Association, which is "To help make Eastern Iowa the safest place in the world to invest money in live stock."

His last contribution to veterinary literature was a discussion on "Bacterial Interference with Serum and Virus Immunization," (*V. M.*, Oct. 1937, p. 454). At the time of his death, he was preparing an article for the forthcoming special issue of VETERINARY MEDICINE on equine practice.

Interment was at Wilton Junction. The funeral was attended by a large number of veterinarians, of whom J. S. Potter and F. J. Crow, Iowa City, Grant B. Munger, R. T. White and J. W. Griffith, Cedar Rapids and J. H. Spence, Clinton, were honorary pall bearers.

The deceased is survived by his widow, a son and two brothers.

Bower Animal Clinic

The small animal hospital operated by Dr. Chas. W. Bower, Topeka, Kans., received a two-column complimentary write-up in the *Topeka Daily Journal*, Dec. 6, 1937.

VETERINARY MEDICINE is to be commended as an advertising medium, aside from its professional merits. In the October issue I advertised my practice for sale and sold it on November 1st. In the November issue I advertised for a position and signed a contract on December 1st. That's service.—*E. G. S.*

Hisel Resigns

Dr. C. C. Hisel, State Veterinarian of Oklahoma since 1927, resigned his position effective December 31, 1937. In the eleven years that Doctor Hisel occupied the position of State Veterinarian, he was instrumental in placing Oklahoma in the modified tuberculosis-free area and in carrying the Bang's disease eradication project a long way towards completion. During the outbreak of infectious equine encephalomyelitis late last summer, he won the united approbation of both veterinarians and horse owners by his vigorous opposition to the purveyors of fake remedies for the cure and prevention of horse plague.

C. C. Hisel

He has been active in the U. S. Live Stock Sanitary Association, but will be best remembered for his indefatigable efforts for the comfort, convenience and pleasure of those who attended the 72nd annual meeting of the A. V. M. A. in Oklahoma City in 1935.

Dr. Daniel H. Ricks (Ala. '30), Oklahoma City, has been appointed the new State Veterinarian of Oklahoma.

New School of Animal Pathology

The heirs of Effingham B. Morris have presented his estate, which has been in the family since the days of William Penn, to the University of Pennsylvania, for the purpose of establishing a School of Animal Pathology. The new school will be intimately associated with the School of Veterinary Medicine, and its purpose will be to investigate the diseases of animals, both domestic and wild. Special attention will be devoted to diseases which are communicable to man.

G. A. Dick, Dean, School of Vet. Med., Univ. of Penn.

The new school will serve as a point of contact between the veterinary school and the medical school of the University, and will offer the former facilities for extending its research and enlarging its teaching facilities and personnel.

The property is located at Bristol, Pa., 30 miles from the University and comprises 400 acres divided into three farms, each with many buildings and well equipped for an animal disease research institution. It adjoins the Wistar Institute of Anatomy farm which was presented to the University by Mr. Morris before his death.

THE need has long been felt for a method controlled by the veterinarian, for dealing with the prevention of nutritional diseases. Just as crucial has been the need for an effective method of handling actual deficiency cases.

Now a method of accomplishing both is available.

Remarkable Dietary Supplement

Earlyne, (used to impregnate all Chappel foods), has been made available in concentrated dry form.

Earlyne represents a compound of proved biological findings of vitamin research, as applied to the known physiological requirements of the dog. It makes available a rich concentration of the several essential nutritive vitamin factors. It comes in a form that proves both efficacious and convenient.

One pound of Earlyne is sufficient for 200 days of treatment for a fifteen pound dog.

Dispensed Through Veterinarians Only

Earlyne Compound is packed in one-half pound bottles and in five pound packages. The bottles are sold exclusively by veterinarians to dog owners where nutritional fortification is needed to augment prescribed diets. The five pound package is intended for the Hospital.

Introductory Offer

1 case of 12 one-half pound bottles (suggested resale price $1.00 per bottle) cost to veterinarians $6.00 per dozen, postage paid.

5 lb. package (for hospital use) cost to veterinarians $2.25, postage paid.

MONEY-BACK GUARANTEE

Hundreds of veterinarians are using and prescribing Earlyne Concentrate. Accompanying each shipment is complete description of dosages and a scientific report of the nutritive requirements for dogs. If after giving Earlyne a fair trial you are not satisfied with results, full purchase price will be refunded.

Chappel Bros., Inc.
503 Peoples Ave.
Rockford, Ill.

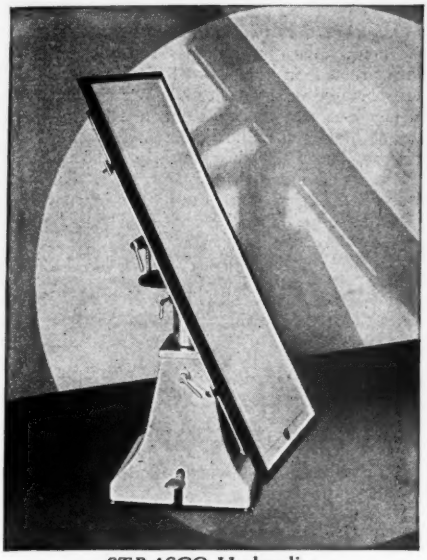
I will give Earlyne a fair trial. If after this trial I am not thoroughly satisfied, I understand my money will be refunded.

Enclosed please find check.....or money-order.....
for.....

.....Please send me post-paid:
.....Cases (12 bottles each) Earlyne
.....5 Lb. pkgs. Earlyne

Ship to.....
Address.....
Town.....State.....

No shipments will be made to other than licensed veterinarians.



STRASCO Hydraulic
SMALL ANIMAL TABLE
$87.50—*descriptive booklet on request.*
R. J. STRASENBURGH CO., ROCHESTER, N. Y.
Manufacturers of TONAMINE

Unpasteurized Milk

More than one-half of the 123,000,000 people in the United States are still consuming potentially dangerous raw, or unpasteurized, market milk even though the public health importance of milk pasteurization has long been established.

Only about 47% of the fluid milk produced in this country is pasteurized. The risk of epidemics due to contaminated raw milk of low grades is still very great.—*James A. Tobey,* New York Health Department.

Making Hay While the Sun Shines

Public interest in vitamins has resulted in a wide field of quackery.

Vitamins are vaunted for their use in colds, rheumatism, blood diseases, acidosis, and even baldness, without the slightest evidence that any shotgun preparation of vitamins can accomplish anything very definite in any of these conditions.

If there is any word of advice that can be given for protection against the quacks, it is "Be Skeptical."—*Morris Fishbein,* Editor, *Jnl. A.M.A.*

Half the poultry flocks of Tennessee are infested by a disease killing young chickens and decreasing the weight and egg production of adult fowls, Dr. Paul W. Allen, University of Tennessee bacteriology department head, told members of the East Tennessee Veterinary Medical Association at its quarterly meeting, December 4th.

RED HEART RECORDS IN GROWTH EXPLAINED:

Thorough Assimilation of Energy Values Proved in Biological Laboratory Tests

Teeth Safeguarded

Laboratory feeding tests on successive generations accurately determine the nutritive value and proper balance of Red Heart Dry Dog Food and reveal that this splendid food promotes steady growth and vigorous health because its energy values may be readily and thoroughly assimilated.

Red Heart Biscuits are important in the daily diet of every dog, to protect his teeth in these 3 ways: harden gums; remove tartar and provide gnawing exercise; supply abundant stores of Sunshine Vitamin D, so essential for strong, healthy teeth.

Red Heart Dry Dog Food is really 24 vital foods in one. Chemists and nutritionists spent a full year in the perfection of its formula. And today, for taste variety to stimulate the dog's appetite, each package contains all *3 flavors* . . . beef, fish, and cheese! John Morrell & Co., Ottumwa, Iowa.

RED RED HEART HEART
DRY DOG FOOD
Heart-shaped Biscuits or Kibbled

Increased calcium— same price!

U. S. Pat. No. 2,043,211

NORCALCINATE 24%
with Dextrose

The calcium gluconate—dextrose dual purpose product

500 cc now contains
Norcalcinate 24%..4¼ oz.
Dextrose, U. S. P. 3½ oz.

500 cc is equal to 500 cc of Norcalcinate 24% solution, plus 100 grams of dextrose. Hence specific for all calcium deficiencies as well as when complicated with acetonemia.

Prices.
Six 500 cc...$4.50; 12-100 cc...$2.85
NORCALCINATE 24% SOLUTION
Six 300 cc...$3.80; 12-100 cc...$2.65
NORCALCIPHOS (Calcium and phosphorus)
Case of six 300 cc. $4.25

NORDEN LABORATORIES
"The Mark of Quality"
LINCOLN · NEBRASKA

Who Pays for this Loss?

In 1935 more than two million cattle, nearly six million hogs, some one million sheep and 360,000 calves marketed in the United States were so seriously bruised in shipment or before as to cause losses in the sale of the meat obtained from them to a value of eleven million dollars. During shipment more than 70,000 hogs, nearly 30,000 cattle and calves, and more than 30,000 sheep died or were crippled during that year in the journey to market, and more than 50,000 died in transit that year.

Dr. and Mrs. Bernard H. Gibson, Newark, Ohio, announce the birth of a daughter, Kathryn Jane.

Patton Biological Laboratories
Formulas - Consultation
Biological Testing
ALL ANIMAL FEEDS

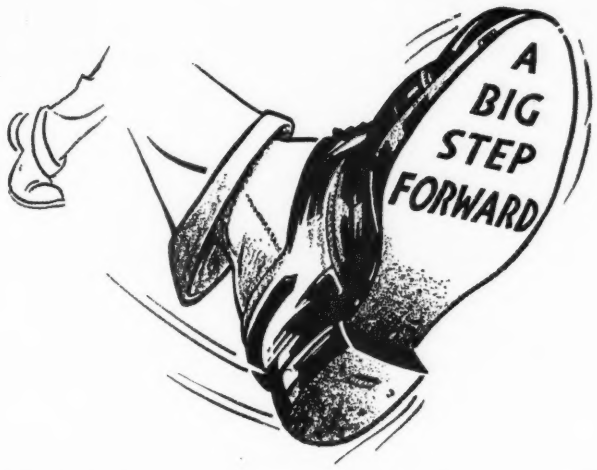
Address all correspondence to
DR. J. W. PATTON
P. O. Box 591 **E. Lansing, Mich.**

HARLTON'S LIQUID BLISTER *and* **FREE BOOKLET**

Easy to apply. Saturate on with hand—no rubbing. Doesn't burn, set skin "on fire," kill hair, or scar. Head let down in few hours. No rest necessary in many cases. Vary application to produce just degree of counter-irritation needed. Diluted with oil, makes any strength liniment desired. FREE SAMPLE—a $1.00 bottle sent free postpaid upon request if you have never had one . . . . treats several cases. It doesn't pay to be without this convenient, effective and economical preparation; write for sample or mail order today. 4-oz. size, $1.00; 16-oz., $3.00.

Detroit Veterinary Supply Co.
460 West Jefferson Avenue, Detroit, Michigan
Canadian Branch, 139 Sandwich St., Windsor, Ontario

LACTOFLAVIN



The Latest Improvement in Gaines Food

We are very proud to announce that, now, Lacto-Flavin is in Gaines Food—both the Meal and the Pelleted types . . . It is hardly necessary to tell the readers of VETERINARY MEDICINE of the importance of this step. Lactoflavin is the most important thing, possibly, in modern scientific nutrition . . . It is especially valuable for dogs. With its filtrate factor, it is considered by many to be a specific for black tongue. It tends to prevent loose bowel movements. However, for dogs, Lacto-Flavin is chiefly valuable for its effect on coats. This latest improvement will, we feel sure, meet with the approval of all veterinarians.

The Gaines Food franchise is, yearly, becoming more valuable. Ask for Professional Samples today—and we will tell you whether or not your territory is open.

GAINES FOOD CO.

Box H-2 **SHERBURNE, NEW YORK**

Warehouses: Seattle—San Francisco—Los Angeles—Houston—Kansas City—Roanoke

Is it

DISTEMPER

or

VITAMIN DEFICIENCY?

That there are marked resemblances between vitamin deficiency effects and certain distemper symptoms in puppies and dogs is indicated by data recently published.* Also, it has been pointed out that an adequate intake of needed vitamins—especially carotene—has an influence in building resistance to infections diagnosed as distemper.

WEEN offers the veterinarian a **liquid** food for puppies which is both rich in essential nutrients, and liberally fortified with carotene and other needed vitamins sufficient for vitamin deficiency protection.

WEEN was developed specifically (1) as a satisfactory replacement for bitches' milk for orphan puppies and heavy litters, (2) to supply ample nutrients, minerals and vitamins in the diet of growing puppies and young dogs for vitamin deficiency prevention and optimum nutrition. (3) To produce a food for puppies made to research standards.

WEEN is also a valuable addition to the diet of in-whelp and nursing bitches, stud dogs and old, sick and convalescent dogs.

WEEN is a liquid and easy to feed. And although made to exacting research standards, WEEN is priced to permit routine feeding. Write for the complete facts about WEEN.

**See the articles on Vitamins and Distemper, Veterinary Medicine, Vol. XXXII, Nos. 1, 2, 4, 5, 7, 9, 10 and 12.*

Life Products, INC.
5th floor, Cook Bldg.
46th & Prospect Ave. Cleveland, O.

WEEN
A Liquid Food For
PUPPIES

VETERINARIANS
are invited to write for our plan for increasing incomes by selling

Vitality
DOG FOOD

Hundreds of veterinarians have discovered this pleasing and sure way of making more money. A full line of **Biscuit, Kibbled, Cubed,** and **Granular Dog Food.** Write for complete information.

VITALITY DOG FOOD Board of Trade Bldg. CHICAGO, ILL.

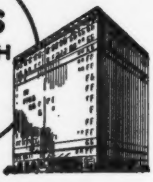
300,000 Quacks

Records of the American Medical Association contain the names and literature of more than 300,000 charlatans who have from time to time preyed upon the American people.

Of all the ghouls who feed on the bodies of the dead and dying, the cancer quacks are most vicious and unprincipled. Notwithstanding the fact we do not yet know the cause of cancer nor any specific method of prevention, and notwithstanding the fact no drug, no serum, no vitamin, no vaccine, no electrical appliance ever has been established as having any virtue in the control of cancer, charlatans exploit all of these methods from time to time.—*Morris Fishbein,* Editor, *Jnl. A.M.A.*

Hospitality
FIRST and ALWAYS at
HOTEL MELBOURNE

400 ROOMS WITH BATH FROM $2.50 UP



J. K. BRYAN, Manager
ST. LOUIS
LINDELL BOULEVARD AT GRAND

GONADIN

opens entirely new fields for the wide awake practitioner

The tremendous sex stimulating action of Gonadin makes possible:

The production of early spring lambs ahead of the market, and a shorter lambing season;

The prevention of "missing" in valuable brood mares, and reestablished vigor in stallions;

Increased calf crops in beef herds and lengthened service life of bulls;

Controlled breeding in dairy cattle, tending toward a more constant milk supply;

The breeding of certain types of "hypo-functioning" females, in small animal practice, and increased vigor in males on the edge of senility.

CUTTER LABORATORIES BERKELEY CALIF.

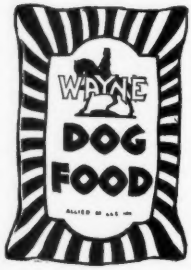
WAYNE DOG FOOD

IS SO GOOD FOR DOGS . . .

Because it contains a wide variety of ingredients all carefully selected and laboratory tested, each with a definite nutritional service to perform.

Wayne Dog Food is made up of a combination of meats, milk, cereals, vegetables and minerals blended together into a perfectly balanced ration that supplies all of the food nutrients dogs require. Each ingredient is placed in Wayne Dog Food to help grow strong, healthy dogs.

That's why Wayne is so good for Veterinarians to use and recommend. That's why WAYNE is the "World's Finest Dog Food". Write for full details.



We do not manufacture dog remedies

KENNEL FOOD DIVISION - ALLIED MILLS, INC.
FT. WAYNE, INDIANA

Fistone First

Thousands of unsolicited letters in our files testify to the efficacy of this supreme anti-suppurant.

Fistula of the Withers, Poll Evil, Quittor, Nasal Gleet, Chronic Metritis, Catarrhal Endometritis and other localized Pyogenic ailments of domestic animals have been successfully treated with Fistone by thousands of practising Veterinarians in the United States, Canada and England.

The universal success of Fistone in the cases of Fistulous wounds of horses and cattle has called forth a host of imitations, but only the genuine invites rigid investigation.

85% of Fistulous cases respond to Fistone! Ask Us!

COUPON

The Fistone and Appliance Company,
College Corner, Ohio.

Enclosed please find check for $8.00, for which send me one dozen 12-ounce boxes of Fistone (trial order) once only. (Regular price $10.) One-half dozen boxes $5.00.

Dr. .....

Address .....

Rabies Loss Heavy

Dr. S. E. Hershey, Charleston, W. Va., discussed rabies at the recent annual meeting of the West Virginia Dairymen's Association. The speaker assailed skeptics who doubt the prevalence and the seriousness of rabies and showed attending delegates two motion pictures at the conclusion of his address.

"In the last 18 months there has been a loss of $50,000 suffered in West Virginia to livestock," the speaker said.

He also stated that 176 head of cattle died within a 100-mile radius of Charleston during that period and that, in addition, nine sheep and four hogs died from the disease in that section of the state.

"These are only the cases with which I am personally familiar. There undoubtedly are many others."

One of the motion pictures shown to the dairymen was of a small boy afflicted with the dreaded disease. The picture, taken a short time before the child's death at a Chicago hospital, brought appalling emphasis to the speaker's address.

"We must not let our sympathy for the dog run away with our better judgment, and I say this even though I am a veterinarian."

Much of the "popular science" foisted upon a bewildered public rises little above voodoo, and some of it is considerably below.

Roentgen Ray and Fluoroscopic Service for Veterinarians

The Anti-Cruelty Society (Chicago) has arranged to supply x-ray and fluoroscopic service to licensed veterinarians at a nominal cost. This service is available weekdays from 9 a. m. to 4:30 p. m. and 9 a. m. to 1 p. m. on Saturday.

Margarine—Butter Consumption

During 1935, the people of the United States ate almost twice as much margarine as they did in 1932. Still, the 1935 production amounted to less than three pounds per person.

Here is a comparison of the per capita consumption of margarine and butter in different countries as prepared by the Institute of Margarine Manufacturers:

POUNDS ANNUALLY PER CAPITA

	Margarine	*Butter*	*Total*
Australia	3.4	29.8	33.2
Belgium	10.4	11.3	21.7
Denmark	48.4	15.1	63.5
Finland	5.5	6.3	11.8
France	19.1	8.5	27.6
Germany	16.8	16.	32.8
Netherlands	17.5	14.3	31.3
Norway	37.1	12.	49.1
Sweden	19.1	16.5	35.6
United Kingdom	10.8	24.5	34.5
United States	2.4	17.6	20.

(Figures on Australia and Finland are for 1930; Netherlands and United Kingdom, 1933-34 average; Sweden, 1928. Others are 1929-32 four-year average.)

Livestock Improvement Aided by Research

External appearance of animals, in livestock judging, has some value as a basis of selection, but research by the Bureau of Animal Industry, U. S. Department of Agriculture, has indicated more accurate ways of selecting breeding stock.

The development of improved types of animals is dependent on proper combinations of hereditary units in the germ plasm which influence growth, mature size, prolificacy, economical use of feeds, color, quality of products, and other characteristics. Results of recent experiments, combined with analytical studies of production records, indicate new methods and relationships having a practical bearing on efficient animal production and the quality of livestock products.

Some Results of Breeding Research

In experiments with beef and dual-purpose cattle, rapid gains in weight of steers were correlated with economical gains. There was a positive relationship also between economy of gain and grade of steers at time of slaughter. At market values prevailing at the time of the study, about 90% of the profit resulted from the combined influences of economy of gain and of slaughter grade.

Three New Regional Research Laboratories

Three new regional laboratories for investigation of regional problems of agriculture were outstanding developments last year in the program of scientific research in which the states are coöperating with the United States Department of Agriculture according to James T. Jardine, Chief of the Office of Experiment Stations, in his annual report to the Secretary of Agriculture. A laboratory for study of animal parasites in the Southeast, one for development of swine breeding in the North Central States, and a third laboratory for sheep improvement in the range states, were approved under provisions of the Bankhead-Jones Act.

The three new laboratories approved during the last fiscal year supplement three similar developments of the previous year—the vegetable breeding laboratory for the Southeast, the soybean laboratory in the Corn Belt, and the pasture improvement laboratory for the Northeast—which are now well established with research going forward. Doctor Jardine says that this development of research according to regional needs "has had the wholehearted, active interest and help of the state stations."

The laboratory for the study of diseases and parasites of domestic animals is being established at the Alabama Polytechnic Institute at Auburn. The experiment stations of 13 southeastern States are coöperating with the Department in the development of the program for the regional studies which will be under way in all the states with headquarters and coördinating direction at Auburn. The states are: Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Tennessee, Kentucky and Oklahoma.

Headquarters for the laboratory devoted to the improvement of swine through breeding methods are to be at the Iowa experiment station at Ames. Thirteen states in the region outlined the program and Iowa, Minnesota, Nebraska, and Missouri have agreed to participate actively. It is expected that the other nine states—Illinois, Indiana, Michigan, Kansas, North Dakota, Ohio, Oklahoma, South Dakota and Wisconsin—and possibly other states, will arrange for active coöperation.

For the improvement of sheep on western ranges, 12 range states—Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Texas, Utah, Washington and Wyoming—are cooperating in the program which will center at Dubois, Idaho, where the Department has suitable range available from its previous work with sheep improvement. Texas is interested in sheep breeding and for this program is included as one of the range states. Plans and specifications for the laboratory required by the enlarged program of research were approved before the end of the fiscal year and the work is now going forward.

From regular production comes the Pard used in feeding tests at the Experimental Kennels of Swift & Company

This Swift & Company product contains: Beef Meat Food Products . . . Whole Wheat . . . Barley . . . Tomato Puree . . . Dry Skim Milk . . . Edible Bone . . . Cod Liver Oil . . . Salt.

● There is only one Pard. And whether it is used from your dealer's stock, or direct from the Nutritional Division of Swift's Research Laboratory, it contains the same ingredients, in the same proportions. That's why the health records of the dogs in Swift & Company's Research Experiment in Dog Food are so valuable to veterinarians.

Every dog in Swift & Company's Experimental Kennels is weaned to an exclusive Pard and water diet . . . and kept on this regimen throughout his life. And in more than 3½ years, *not one dog has ever had a sick day due to feeding disorders!* Litters have been sturdy and normal. Pups have developed rapidly and conformed well to breed. Lactation and reproduction have been excellent.

On scientific evidence like this Pard rests its case as a well-balanced food for dogs.

PARD SWIFT'S CANINE-TESTED FEEDING FORMULA

WHEN YOU USE IDEAL DOG FOOD:

You get a better Dog Food, one that furnishes every natural ingredient required for complete and proper nutrition of dogs and cats.

—beautiful, useful, quality FREE GIFTS in exchange for labels.

—an extra ten-label certificate in every 48 can case.

Ideal Dog Food is a product of

U. S. Yards WILSON & CO. Chicago, Ill.

Write for Free Gift Catalogue Dept. 85

Ideal DOG FOOD

Wilson & Co. are distributors of Old Trusty Products

The veterinary hospital of Dr. Wm. Gates, Clarksdale, Miss., was badly damaged in a fire, January 9th. A number of dogs and cats were burned before a rescue could be effected.

The Caddo-Shreveport (Louisiana) health unit has distributed dog license tags to all veterinarians in Shreveport, where dog licenses are issued by the veterinarians to dogs vaccinated against rabies, upon the payment of a fee of $1.50.

The Oakland (Calif.) Civil Service Board complains (*Oakland Tribune* of January 16th) of lack of applicants for the position of meat inspector in the City Health Department. The position pays an entrance salary of $185 per month. A license to practice in California is a prerequisite for the job.

The Western Coöperative Dairymen's Union (Los Angeles) has engaged a veterinarian to check by post-mortem inspection all animals belonging to members of the Association which have been condemned for tuberculosis. Under a ruling of the California courts owners may sue the state for the value of animals slaughtered in the statewide bovine tuberculosis cleanup in which lesions of tuberculosis are not found on post-mortem examination.

TONAMINE

Rich in Food Value

An effective reconstructive. TONAMINE builds up the strength of undernourished puppies and convalescent animals. Restores the appetite of run-down small animals. Successfully offers Vitamins B, G, and D as a supplement to regular diet. Good for distemper. Write for booklet.

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Pharmaceutical Chemists Since 1886

Send for veterinary pharmaceutical catalog.

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H.W.&D. *is a background of*

Precise manufacturing methods insuring uniformity

Controlled laboratory investigation

Chemical and biological control of each lot produced

Extensive clinical application

Thirteen years' acceptance by the Council of Pharmacy and Chemistry of the American Medical Association

ACCEPTED AMERICAN MEDICAL ASSN.

HYNSON, WESTCOTT & DUNNING, Inc., Baltimore, Md.

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Patent Pending

Vaporizable - Non-Irritating Iodine

When NOVIDOL is given orally, the body heat causes the vapor of non-irritating iodine to be given off gradually. We are literally able to paint atomistic iodine over the whole gut.

When you want IODINE—use NOVIDOL externally, internally and eternally.

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Literature on Request

IODINE PRODUCTS COMPANY

Manufacturing Chemists

410-12 E. Rittenhouse St., Philadelphia, Pa.

Illinois Veterinary Meeting

The next annual meeting of the Illinois Veterinary Medical Association will be held in Springfield, February 17-18, 1938.

Civil Service Examination for Parasitologist

The U. S. Civil Service Commission will hold an open competitive examination for Junior Scientific Aid in the Federal Bureau of Animal Industry. The salary is $1440 and applications for the examination must be in the hands of the U. S. Civil Service Commission, Washington, D. C., on or before February 28, 1938.

The duties of the position include:

Subordinate laboratory work, such as examining the feces and blood of animals for evidence of parasitism, preparing blood smears for microscopic study, assisting in post-mortem examinations of animals for evidence of parasitism, preserving, sectioning, and staining animal tissues, and the maintaining of a collection of parasites and other simple laboratory duties as assigned.

Applicants must be citizens of the United States, and not have passed their 35th birthday. They must have had at least two years experience in a zoölogical laboratory, performing work similar to the above, or in lieu of such experience, one year of study including a course in zoölogy successfully completed in a college or university.

VITOL

McKENNA REG. U. S. PAT. OFF.

Vitol the original supplement now sets a new standard in the field—the first vitamin and mineral supplement to publish its remarkable vitamin and mineral content.
Vitol, biologically tested, contains in each ounce more than:

8000 U.S.P.X. 1 units of Vitamin A
85 Sherman units of Vitamin B
40 International units of Vitamin C
437 U.S.P.X. 1 units of Vitamin D
142 Sherman units of Vitamin G

The product contains two excellent carriers of Vitamin E in substantial amounts. It also contains essential mineral elements such as calcium, phosphorus, iron and copper. The calcium-phosphorus ratio of Vitol is approximately 2:1.

EGGS YEAST COD LIVER OIL BONE MEAL or VEGETABLES
are not necessary when VITOL is used. Two tablespoonsful of VITOL to each pound of ordinary food gives a balanced diet.

Vitol (McKenna) Is Reasonably Priced

5-lb. cans, less than six	**$ 2.20**
6 5-lb. cans	**12.00**
24 12-oz. cans	**12.00**
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Leading Veterinary Supply Houses Distribute Vitol

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NORCALCINATE 24%
with Dextrose

The calcium gluconate — dextrose dual purpose product

500 cc now contains
Norcalcinate 24%..4¼ oz.
Dextrose, U. S. P. 3½ oz.

500 cc is equal to 500 cc of Norcalcinate 24% solution, plus 100 grams of dextrose. Hence specific for all calcium deficiencies as well as when complicated with acetonemia.

Six 500 cc...$4.50; 12-100 cc...$2.85

•

NORCALCINATE 24% SOLUTION
Six 300 cc...$3.80; 12-100 cc...$2.65

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NORCALCIPHOS (Calcium and phosphorus)
Case of six 300 cc. $4.25

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Easy to apply. Saturate on with hand—no rubbing. Doesn't burn, set skin "on fire," kill hair, or scar. Head let down in few hours. No rest necessary in many cases. Vary application to produce just degree of counter-irritation needed. Diluted with oil, makes any strength liniment desired. FREE SAMPLE—a $1.00 bottle sent free postpaid upon request if you have never had one . . . . treats several cases. It doesn't pay to be without this convenient, effective and economical preparation; write for sample or mail order today. 4-oz. size, $1.00; 16-oz., $3.00.

Detroit Veterinary Supply Co.
460 West Jefferson Avenue, Detroit, Michigan
Canadian Branch, 139 Sandwich St., Windsor, Ontario

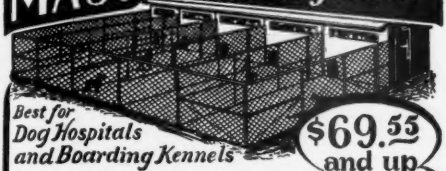
Pan-American Medical Congress

The seventh convention of the Pan-American Medical Congress will be held in Havana, Cuba, February 18-23, 1938. The congress consists of 22 sections of distinct medical specialties and those contributing to the program include leaders in the medical and allied professions in both Latin America and North America. Dr. Peter Kauri, president of the Section on Parasitology, invites all interested veterinarians to attend that section.

The Westchester (N. Y.) Veterinary Club has announced a proposal to treat free of charge, animals belonging to persons who cannot afford to pay for veterinary services. The animals will be cared for at the offices of any one of 25 veterinarians practicing in Westchester County, provided that the animals are sent by an authorized representative of any of the county humane societies. The announcement was made by Orville E. McKim, chairman of the Veterinary Club.

A survey conducted by H. A. Seidell, State Veterinarian of Iowa, shows that there were 27,533 cases of encephalomyelitis in the state last season, of which 6,583 (24%) died. As the report is not yet complete, Doctor Seidell estimates that the total number of cases was about 30,000, including 154 mules, of which 37 died, and 2,067 suckling colts, of which 176 died. The number that died is less than 1% of the total number of horses and mules in Iowa.

MASON'S *Kennel Fences*



Best for Dog Hospitals and Boarding Kennels

$69.55 and up

Mason's are Real Kennel Fences—Strong, Good Looking and sold under a Money Back Guarantee to hold the largest and strongest dogs. Used and approved by best Kennels everywhere.

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Our Cards Are On The Table

Regardless of what you think about *selling* Dog Foods, you need have no hesitancy in *recommending Vitality* to your patrons. We do not manufacture remedies and we always advise dog owners to see a reliable Veterinarian for medical service.

Vitality Mills make the finest Dog Foods that modern science and outstanding canine nutritionists have been able to develop.

Vitality DOG FOODS

are constantly under rigid feeding tests. Hundreds of large users of *Vitality* state that their dogs are sturdy, filled with stamina, sleek of coat and clear of eye on a *Vitality* diet.

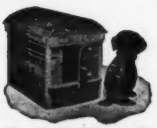
We bid for your good will purely on the basis of the outstanding merits of our dog foods. Samples will be sent cheerfully on request.

VITALITY MILLS, INC.

Dept. VM-3 Board of Trade Chicago, Ill.

Veterinarians in New Locations

W. H. Griswold, who had been practicing for a number of years at Earlham, has located in Winterset, Iowa; E. C. Cavanaugh, after eight years in Federal B. A. I., has returned to his former practice in Johnstown, Pa.; G. J. Paul, located in Melrose for the past 16 years, has moved to St. Cloud, Minnesota, where he has taken over the practice of the late C. B. Estey; M. C. Larson, a senior in the Iowa State College, has purchased the practice of the late Dr. Henry Hell and will move to Wilton Junction, Iowa. June 1st. Harold G. Rosenbaum has moved from East Lansing to Lansing, Mich.; Lloyd D. Jones, from Fort Brady, Mich., to Evanston, Ill.; M. H. Johnson, from Bonesteel to Sisseton, S. Dak.; Hilding Marlowe, from Berkeley, Calif., to Vancouver, Wash.; Ernest Rivers, from Stoneham, Mass., to Columbus, Ohio; Robert Ruse, from The Dalles to Coquille, Oregon; Chas. H. Elliott, from St. Paul, Minn., to Yorkville, Ill.; P. L. McClave, from Estes Park to Fort Lupton, Colo.; Chas. W. Gates, from Burlington, Vt., to Sanford, Maine; L. E. Spong, from Bentonville, Ark., to Iola, Kansas; John D. Paxton, from Sacramento to Fresno, Calif.; W. D. Redman, from Avoca, Iowa, to Shelbyville, Ky.; C. A. DeValois, from Boyden to Sheldon, Iowa; W. F. Hall, from Okmulgee to Chickasha, Okla.; E. L. Mouls, from Columbus, Ohio, to Milwaukee, Wis.; Rolland Anderson, from Worland, Wyo., to Elkhorn, Wis.; Geo. M. Kerr, from Harrisonburg to Richmond, Va.; C. C. Warkentin, from Gilroy to Sacramento, Calif.; H. G. Norman, from High Point to California, Mo.; Sheo Piao, from Ames, Iowa to China; J. A. Patton, from Ottumwa, Iowa to Milwaukee, Wis., and C. H. Chapman, from Weston, Ont., to Winnipeg, Man.



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OUR NEW LOW PRICED DOG CRATES AND BEDS

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Periostine

Horse Back To Work in Three To Five Days

It is a powerful antidote to inflammation occurring in the periosteum, articulations, bursæ, tendons, ligaments; also where there is pain, exostosis or lameness. Usually only one application is necessary. One bottle is sufficient to treat three or more cases.

Endorsed by almost every veterinarian that has given it a trial.

FREE Booklet—"Reminders in Diagnosing Obscure Lameness."

Price per bottle..$2.00
Three bottles 5.00

Free Sample. To Every Veterinarian that has not received a sample, we will gladly send postpaid a liberal sample upon request. No obligation.

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WEEN
Saves
PUPPY LIVES

Disease takes an all-too-great toll of puppies and young dogs. While some of these puppies and dogs are lost or irreparably damaged by distemper, certain forms of vitamin deficiency* produce symptoms hard to differentiate from distemper.

WEEN, the new *liquid* food for puppies and young dogs, was developed to provide a food rich in nutrients, and fortified with all the vitamins the puppy needs for best growth and development. The liberal provision of carotene in WEEN also plays a part in building general resistance to certain infectious canine diseases.

Veterinarians throughout the country are finding WEEN a dependable replacement for bitches' milk for orphan puppies, and for solving many nutritional problems in canine practice.

Let us send you complete information about this valuable food.

*See the articles on Vitamins and Distemper, Veterinary Medicine, Vol. XXXII, Nos. 1, 2, 4, 5, 7, 9, 10 and 12.

Life Products, INC.
5th floor, Cook Bldg.
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WEEN
A Liquid Food For
PUPPIES

Carl Koll, Iowa, '34, has joined the staff of Dr. F. F. Parker of Des Moines, Iowa. Since graduation Doctor Koll has been engaged in small animal practice in El Paso. He will be chief assistant to Doctor Parker and will specialize in surgery of small animals.

About 45 veterinarians, including some from North Carolina and Georgia, attended the annual sessions of the South Carolina Veterinary Medical Association at Columbia, January 18, 1938. The officers elected for the ensuing year, are: J. H. Moore, Charleston, president; D. O. Kitchen, Greenville, vice-president; and R. A. Mays, Columbia, reëlected secretary-treasurer. The next meeting will be held at Charleston next summer, the dates to be selected later.

More than one hundred attended the 23rd annual meeting of the Oklahoma Veterinary Medical Association in Oklahoma City, January 10-11, 1938. Visitors participating in the program were: H. D. Bergman, president-elect of the A. V. M. A.; H. C. Smith, Fort Dodge Laboratories; Ashe Lockhart, Kansas City; B. M. Lyon, Lederle Laboratories; and S. W. Haigler, practitioner, St. Louis.

The officers elected for the ensuing year, are: H. B. Morgan, Muskogee, president; G. A. Cunningham, Lawton, vice-president; and F. Y. S. Moore, McAlester, reëlected secretary-treasurer.

Fistone First

Thousands of unsolicited letters in our files testify to the efficacy of this supreme anti-suppurant.

Fistula of the Withers, Poll Evil, Quittor, Nasal Gleet, Chronic Metritis, Catarrhal Endometritis and other localized Pyogenic ailments of domestic animals have been successfully treated with Fistone by thousands of practising Veterinarians in the United States, Canada and England.

The universal success of Fistone in the cases of Fistulous wounds of horses and cattle has called forth a host of imitations, but only the genuine invites rigid investigation.

85% of Fistulous cases respond to Fistone! Ask Us!

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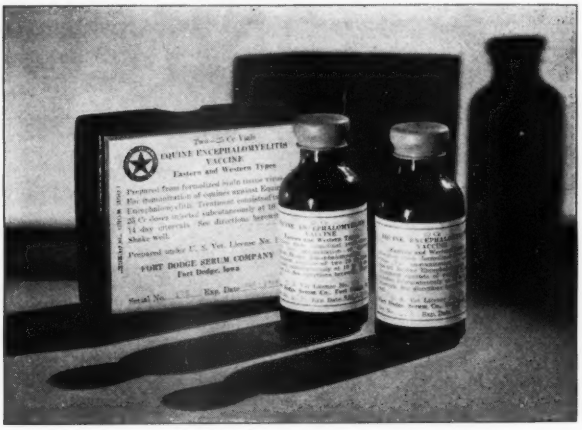
The Fistone and Appliance Company,
College Corner, Ohio.

Enclosed please find check for $8.00, for which send me one dozen 12-ounce boxes of Fistone (trial order) once only. (Regular price $10.) One-half dozen boxes $5.00.

Dr. .....

Address .....



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FORT DODGE TWO-DOSE ENCEPHALOMYELITIS VACCINE

WESTERN AND EASTERN STRAINS

Data compiled from replies to questionnaires by 170 veterinarians in heavily infected areas during 1937 indicate, beyond doubt, exceedingly high field efficiency for Fort Dodge Encephalomyelitis Vaccine. Of 31,816 horses that received this vaccine during the 1937 outbreak only 351 head (1.1%) developed the disease. Of the 23,712 horses that received two doses, only 153 (0.64%) developed the disease following the second dose of vaccine. Therefore, of every 1,000 horses properly vaccinated prior to the outbreak season, 994—all but a scant 6—should be protected even in the face of severe field exposure, when immunized with Fort Dodge Encephalomyelitis Vaccine.

FORT DODGE LABORATORIES, Inc., Fort Dodge, Iowa

Member, Veterinary Exhibitors' Association

You Can Safely Recommend

WAYNE DOG FOOD

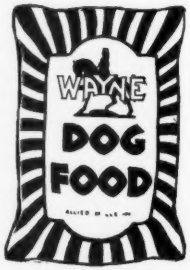
To Your Clients

Wayne Dog Food is a high protein feed and contains plenty of meat, fish and milk. It is well fortified with all of the essential vitamins A, B, D, E and G, which dogs need for good health, growth and vitality.

Note the variety in this complete list of ingredients used to make Wayne. Is it any wonder that Wayne does such a good feeding job and is widely known as "The World's Finest Dog Food"?

WAYNE DOG FOOD (Krums, Blox or Pellets)

Ingredients: Beef, Fish, Animal Liver, Skim Milk, Buttermilk, Whole Yellow Corn Flakes, Whole Wheat Flakes, Rolled Oats, Wheat Bran, Beets, Tomatoes, Dehydrated Alfalfa Meal, Soybean, Wheat Germ, Corn Germ, Barley Malt, Brewers' Yeast, Cane Molasses, Wheat Germ Oil, Sardine Oil, Steamed Bone Meal, Charcoal, Iron Oxide, Potassium Iodide, Calcium Carbonate, Copper Sulphate, Calcium Gluconate, Manganese Sulphate, Sodium Chloride. Analysis: Protein 25%. Fat, 4%. Fiber, not over 5%.



We do not manufacture dog remedies

KENNEL FOOD DIVISION - ALLIED MILLS, INC.
FT. WAYNE, INDIANA

At the 34th annual meeting of the Kansas Veterinary Medical Association, Dr. C. H. Kitselman of Manhattan, estimated that 10,000 horses in Kansas suffered from an attack of infectious equine encephalomyelitis during the past season. The mortality was approximately 15%. He regards ticks as the principal agent for the transference of the disease from animal to animal in the Kansas epizoötic.

Officers of the Kansas association elected for the ensuing year are: Kent R. Dudley, Iola, president; Jos. R. Bogue, Wichita, vice-president; N. L. Townsend, Topeka, member of the Executive Board; and Chas. W. Bower, Topeka, reëlected secretary-treasurer.

At the 24th annual meeting of the Western New York Veterinary Association, Dec. 16, 1937, the following officers were chosen for the ensuing year: Joseph V. Hills, Gowanda, president; J. G. Bircher, Rochester, vice-president; Erastus Thompson, Honeoye Falls and Leonard J. Desson, Rochester, members of the board of directors; and Frederick F. Fehr, Buffalo, reëlected secretary-treasurer.

Dr. Naylor's Medicated Teat Dilators

A safe and dependable treatment for Spider Teats, Scab Teats, Cut and Bruised Teats Obstructions and for keeping teat canal open after operating.
Dr. Naylor Dilators fit either large or small teats without overstretching or tearing, are easy to insert and stay IN the teat. They carry antiseptics and healing agents into teat canal to combat infection and promote healing. The dilators themselves are Sterilized. Soft, Absorbent dressings which protect the inflamed area, absorb inflammatory exudates and keep teat canal open in its natural shape while tissues heal.

Price to Veterinarians

Dollar Package (contains 48 Dilators).....$8.00 Per Doz.
Fifty Cent Package (contains 18 Dilators)..... 4.00 Per Doz.
←Plain Dispensing Package (contains 15 Dilators)..... 3.00 Per Doz.

H. W. NAYLOR CO. MORRIS, N. Y.

GONADIN

opens entirely new fields for the wide awake practitioner

The tremendous sex stimulating action of Gonadin makes possible:

The production of early spring lambs ahead of the market, and a shorter lambing season;

The prevention of "missing" in valuable brood mares, and reestablished vigor in stallions;

Increased calf crops in beef herds and lengthened service life of bulls;

Controlled breeding in dairy cattle, tending toward a more constant milk supply;

The breeding of certain types of "hypo-functioning" females, in small animal practice, and increased vigor in males on the edge of senility.

CUTTER LABORATORIES BERKELEY CALIF.

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For Sale, Wanted, etc., $2.00 for 25 words or less; additional words, 8 cents. 25 cents extra when replies are sent in care of VETERINARY MEDICINE.

PRACTICE OF VETERINARY MEDICINE, Udall. Second Edition. $5.00 prepaid. D. H. Udall, New York State Veterinary College, Ithaca, N. Y.

JUDY'S DOG ENCYCLOPEDIA, 2nd ed., all dog subjects, $5.00 cash or C. O. D. Dog World, all-breed monthly, $2.00 for one year; $3.00 for two years; five years, $5.00. JUDY PUBLISHING COMPANY, 3323 S. Michigan Blvd., Chicago, Ill.

VETERINARY PRACTICES, physicians, etc., furnished; also assistants, etc. Practices handled for sale. F. V. Kniest, 1537 S. 29th St., Omaha, Nebr. Established 1904.

NEW BOOK ON HORSESHOEING, containing 164 cuts of shoes, with full description of each shoe. The most valuable information to veterinarians. $1.00, postpaid. Henry Asmus, New York State Veterinary College, Ithaca, N. Y.

ASSISTANT WANTED: General practice, near New York City. Single man, to live on premises. Address No. 187, care of VETERINARY MEDICINE.

WANTED: Graduate, experienced veterinarian desires position as assistant. Single. Willing to work. Good references. Address No. 198, care of VETERINARY MEDICINE.

FOR SALE: Excellent veterinary practice in Wisconsin. Full details on request. Address No. 200, care of VETERINARY MEDICINE.

FOR SALE: Excellent location. Northern Iowa. Modern home and office building. Unopposed territory. Good roads. Collections good. Sacrifice price. Terms. Best reasons for selling. Address No. 201, care of VETERINARY MEDICINE.

The annual veterinary short course of the Alabama Polytechnic Institute, will be held at Auburn, February 21-26, 1938.

WANTED: Position with general practitioner. Young veterinarian who has conducted own practice for past ten years, mostly small animals, wishes to work with veterinarian with first class horse and cow practice. No big salary expected. Plenty of energy. New York State preferred. Address No. 197, care of VETERINARY MEDICINE.

FINE SADDLE HORSES? Full reports of all shows? Beautiful horse pictures? Advice on his training? Complete saddle horse news for only $3.00 per year, (12 beautiful magazines). The National Horseman, 512 Fourth St., Louisville, Ky.

WANTED: Second hand copy of book on Bacteriology by H. W. Conn, Ph. D. Drop a card and give your price. Address: P. C. Hutchinson, Natoma, Kansas.

A GRAND NEW BOOK—Diseases and Surgery of the Dog—(Alphabetically Arranged) By Raymond J. Garbutt. A description of practically all the diseases and surgical conditions of the dog, and their treatment. An everyday reference book for the dog fancier whether he keeps a single dog or operates a kennel in which many dogs are kept. 336 Pages. Profusely illustrated. $3.50 postpaid. Orange Judd Publishing Company, 15 East 26th Street, New York City.

WANTED: Summer employment with practitioners anywhere in the United States or Canada, by undergraduate students. Available May 1, 1938. The most suitable applicants will be submitted. Address: Students Employment Association, Ontario Veterinary College, Guelph, Ont., Canada; C. E. Phillips, Sec.

FOR SALE: Owing to illness, will sell small animal practice, including best equipment, in Midwestern city of 150,000. Low rental. Address No. 199, care of VETERINARY MEDICINE.

American Animal Hospital Assn.

The fifth annual meeting of the American Animal Hospital Association will be held in Washington, D. C., March 24-26, 1938. An outstanding program is promised.

May we send you **FREE** *the new*
SQUIBB VETERINARY HANDBOOK
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and Price List; describing in detail almost 200 Veterinary Specialties; in many cases with indications and recommended dosages; quoting regular veterinary hospital discount prices.

E. R. SQUIBB & SONS, 745 FIFTH AVENUE, NEW YORK
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THE need has long been felt for a method controlled by the veterinarian, for dealing with the prevention of nutritional diseases. Just as crucial has been the need for an effective method of handling actual deficiency cases.

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Earlyne, (used to impregnate all Chappel foods), has been made available in concentrated dry form.

Earlyne represents a compound of proved biological findings of vitamin research, as applied to the known physiological requirements of the dog. It makes available a rich concentration of the several essential nutritive vitamin factors. It comes in a form that proves both efficacious and convenient.

One pound of Earlyne is sufficient for 200 days of treatment for a fifteen pound dog.

Dispensed Through Veterinarians Only

Earlyne Compound is packed in one-half pound bottles and in five pound packages. The bottles are sold exclusively by veterinarians to dog owners where nutritional fortification is needed to augment prescribed diets. The five pound package is intended for the Hospital.

Introductory Offer

1 case of 12 one-half pound bottles (suggested resale price $1.00 per bottle) cost to veterinarians $6.00 per dozen, postage paid.

5 lb. package (for hospital use) cost to veterinarians $2.25, postage paid.

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Hundreds of veterinarians are using and prescribing Earlyne Concentrate. Accompanying each shipment is complete description of dosages and a scientific report of the nutritive requirements for dogs. If after giving Earlyne a fair trial you are not satisfied with results, full purchase price will be refunded.

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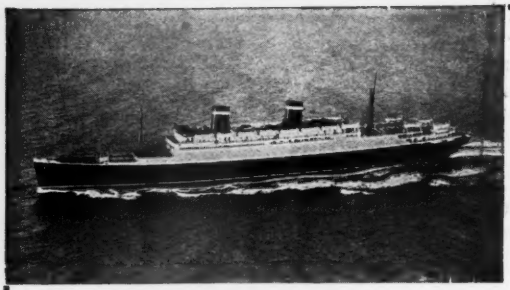

The Only Official Tour of Europe of the

AMERICAN VETERINARY MEDICAL ASSOCIATION

to attend the International Veterinary Congress, Zurich and Interlaken, August 20-27, 1938.

The tour party will leave New York July 13th, 1938, in the United States Line, SS MANHATTAN and return to New York September 15th, in the United States Line, SS WASHINGTON.

DIRECTORS OF TOUR

Dr. Adolph Eichhorn in charge of the professional program; Dr. Stanley R. Markheim, Vice-President TREASURE TOURS Inc., in charge of sight-seeing program.

This most interesting professional sight-seeing tour will include visits in England, Belgium, Holland, Germany, Austria, Hungary, Italy, Switzerland and France.

The participants will be given the opportunity to study veterinary institutions and veterinary organizations of the different countries to be visited, also attend the receptions arranged by the government officials of these countries.

Deposits of $100 for the reservation should be sent as soon as possible in order to insure good accommodation on the steamship.

The cost of the tour is $794 plus $5 United States Revenue tax and $1.40 French embarkation tax.

Detailed itinerary and any additional information will be sent upon request. Address inquiries to

TREASURE TOURS, Inc. **24 WEST 40TH STREET NEW YORK, N. Y.**

VETERINARY TOUR

Thos. Cook & Son announce an **official tour** to the 13th International Veterinary Congress at Zurich and Interlaken, Switzerland, August 20 to 27, 1938, under the direction of Dr. D. M. Campbell.

The tour, which sails from Montreal July 23 will visit Scotland, England, Denmark, Germany, Holland, Belgium, France, Switzerland, Italy, Yugoslavia, Greece, Sicily, Algeria, Portugal and the Azores, arriving in New York September 15, 1938.

The complete tour, which includes first class hotels throughout, a diversity of sight-seeing trips to places of scenic and tourist interest, as well as visits to important veterinary colleges in Europe, costs $614.00.

For further particulars communicate with

THOS. COOK & SON **16 NORTH MICHIGAN CHICAGO, ILLINOIS**

The new State Board of Veterinary Examiners of Georgia comprises E. B. Carlisle, Camilla, president; R. O. Barnes, Claston; A. B. Griner, Fitzgerald; O. M. Mathis, Griffin; and J. M. Sutton, State Veterinarian, Atlanta, secretary.

The new officers of the Wisconsin Veterinary Medical Association are: E. L. Morgenroth, Kewaskum, president; J. S. Healy, Madison, vice-president; W. F. Nolechek, Thorp, and F. W. Sutcliffe, Mt. Horeb, members of the board of directors; and B. A. Beach, Madison, was reëlected secretary-treasurer.

The new officers of The State Veterinary Medical Association of Texas are Leon G. Cloud, Fort Worth, president; R. P. Marsteller, College Station, honorary president; Sam E. Bunton, Del Rio, vice-president; Wm. F. Hayes, Farmersville, second vice-president; Dee Pearce, Leonard, reëlected secretary-treasurer, and M. B. Starnes, Dallas, reëlected corresponding secretary.

The new officers of the Tennessee Veterinary Medical Association comprise J. I. Siress, Cleveland, president; S. H. Woods, Murfreesboro, first vice-president; D. Coughlin, Knoxville, second vice-president; A. C. Topmiller, State Veterinarian, Nashville, secretary-treasurer; and John H. Gillmann, Memphis, representative to the House of Representatives of the A. V. M. A.

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Deaths of Veterinarians

Henry J. Mongeau, 55, Chicago, December 28, 1937; Cesare Masero, 82, Oakland, Calif., January 1, 1938; E. L. Dudgeon, 54, Platte City, Mo., January 15, 1938; L. V. Murrian, Port Jervis, N. Y., November 17, 1937. Edward B. Giller, 51, White Hall, Ill. of a brain tumor, Jan. 19, 1938; Sherman W. Mount, 72, Milwaukee, Wisc., Jan. 28, 1938; F. M. Emrick, 83, West Manchester, O., Jan. 20, 1938; Samuel C. Neff, 68, Waynesboro, Va., Jan. 19, 1938.

Doctor Mongeau was a small animal practitioner in Chicago and president of the American Cat Association. Death was due to a heart attack. Doctor Masero was veterinarian for the Tanforan and Bay Meadows Race Tracks until his retirement a year ago. He had served such well known stables as the Leland-Stanford and the Adolph Spreckles stock farms. Doctor Giller too was nationally known among breeders of trotters and pacers. Doctor Neff was known as the father of the Staunton County (Va.) fair.

At the annual meeting of the Wisconsin Veterinary Medical Association in Madison, January 11-12, 1938, an invitation was extended to the American Veterinary Medical Association to hold its 1939 meeting in that city.

HORSES *and* MULES

Will soon be in demand for farm work. Horses and mules are selling for a fair price and the increased demand will result in more sales and more traffic in horses and mules and this will facilitate the spread of strangles and shipping fever. These diseases are of considerable economic importance because of the serious handicap to the putting in of farm crops. Strangles, other streptococcic infections, and hemorrhagic septicemia are the most common equine diseases this season of the year.

It is not uncommon for all horses and mules on a farm to become affected with these diseases and thus cause suspension of all farm work. The prevention of these diseases is possible by the use of symbiotically prepared bacterin. Because of the widespread occurrence of these maladies, it is advisable to treat all farm horses and mules before spring work begins. This kind of service will be appreciated by horse owners.

Kinsley's symbiotically prepared Influenza bacterin has been successfully used, not only on farms, but also in public markets. One injection usually suffices as a preventive agent for unexposed animals. Two or more injections should be given to exposed animals.

Our Streptococcus bacterin is par-excellent in the control of colt strangles, and pyaemic arthritis bacterin is of value in controlling navel ill.

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American Animal Hospital Association

The fifth annual meeting of the American Animal Hospital Association will be held at the Mayflower Hotel, Washington, D. C., March 24, 25, and 26, 1938.

The program will include: Address of President, S. W. Haigler, St. Louis, Mo.; Intra-Tracheal Anesthesia with Artificial Respiration in Chest Surgery of Small Animals, Allan C. Secord, Toronto, Ont.; New Days, New Ways, E. Burton Corning, Architect, Washington, D. C.; Parasites and Parasite Control, Maurice C. Hall, Chief, Division of Zoölogy, United States Public Health Service, Washington, D. C.; Intestinal Surgery, Victor Carraba, New York University Hospital, New York, N. Y.; Kidney Dysfunction in the Dog and Its Relation to Sulfanilamide Therapy, David F. Green, James B. Allison, and Mark L. Morris, The Departments of Physiology and Biochemistry, Rutgers University and the Raritan Hospital for Animals, New Brunswick, N. J.; Infectious Gastritis of Dogs, H. J. Shore, Fort Dodge Laboratories, Fort Dodge, Ia.; Some Phases of the Pathological Physiology of the Blood-Vascular System of the Dog, Roger S. Amadon, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., and committee reports.

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LENTIN, by its rapid and powerful effect upon parasympathetic nerves, increases the tone of the bowel musculature, stimulates peristalsis and the secretion of normal saliva, gastric, and intestinal juices. Its effects are more rapid and pronounced than those of Arecoline, Eserine, or Pilocarpine.

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Lentin is marketed in two sizes: 6 x 1 cc. ampul LENTIN FOR SMALL ANIMALS (1:10,000 aqueous solution). 6 x 4 cc. ampul LENTIN FOR LARGE ANIMALS (1:1,000 aqueous solution).

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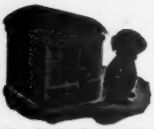

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Deaths of Veterinarians

Geo. W. Bromell, 69, Denver, Colo., Jan. 23, of a heart attack at Atlanta, Ga. Doctor Bromell was formerly a veterinary inspector in the B. A. I. at Kansas City, Kans., and since retirement a meat inspector of the Denver health department. Sherman W. Mount, 72, Milwaukee, Wisc., Jan. 26. Doctor Mount had been a resident of Milwaukee for 48 years, first in general practice and since the World War in the city health department until his retirement two years ago. Geo. McGillivray, Pipestone, Minn., Feb. 3, funeral and interment at Sioux City, Ia. Amos Armstrong, 50 (suicide), Lincoln, Ill., Feb. 10. Henry Bannister (retired), Tampa, Fla., Feb. 11. Paul F. Crosby, 81, Blair, Nebr., Feb. 18. John Evans, 63, Birmingham, Ala., Feb. 19. Payson E. Schwin (automobile accident), 72, Elkhart, Ind., Feb. 19. George W. Clayton, 79, Chicago, Feb. 21. Doctor Clayton was a manufacturer of Clayton's proprietary dog remedies. Wm. B. Craig, 69, Indianapolis, Ind., Feb. 16, 1938.

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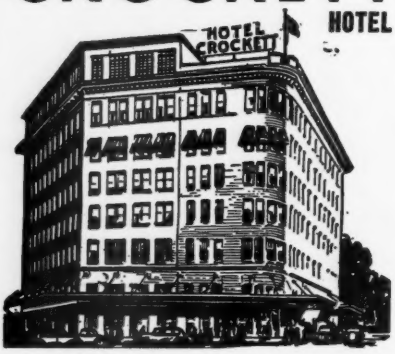

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A THREE-WAY SAFEGUARD FOR DOGS' TEETH, TOO

At left: Dr. Gross checks weight gains of rats fed on Red Heart diet in Morrell's experimental laboratory

● Exhaustive tests are constantly being conducted in Morrell's experimental laboratory to show the high nutritive value of Red Heart Dog Biscuits.

Dr. Gross' experiments on consecutive generations of white rats offer ample proof that this carefully and *conscientiously* formulated dry dog food aids in producing steady growth, in reproduction, and in maintaining all-'round health and vigor. Moreover, Red Heart Biscuits have been tested on dogs under actual kennel and home conditions.

These biscuits should be included in every dog's daily diet to safeguard his teeth by: (1) hardening gums; (2) providing vigorous gnawing exercise; (3) supplying rich stores of Sunshine Vitamin D, so essential for healthy teeth. Use and recommend Red Heart Biscuits for every dog that is entrusted to your care. They come in three flavors, beef, fish, and cheese . . . to stimulate the dog's appetite. Each package contains all three. John Morrell & Co., Ottumwa, Iowa.

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Heart-shaped or Kibbled

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For corpus luteum insufficiency in bitches and cows; infertility; indicated in abortion.

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To promote growth and development of the gonads. Indicated for sterility.

Concentrated Liver Liquid
To stimulate the formation of red blood corpuscles in deficiency anemias.

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Induced contraction of the uterus and other smooth musculatures. Valuable and dependable for uterine atony, postpartum as well as other forms of uterine hemorrhage.

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For temporary deficiency of grown animals, and hypothyroidism in young animals.

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Of value in treatment of streptococcal infections. Used also in mastitis, urinary infections, strangles, navel ill and streptococcal pneumonia.

● Whether you're treating one of your clients' sick pigs or his prize brood mare, you want pharmaceuticals that are dependable. Consistent success requires that they be absolutely stable in quality and potency.... Armour and Company offers you that stability in these products and in their results. Fifty years of research and production in up-to-the-minute laboratories have made Armour Glandular Products leaders in supplying the needs of the veterinary profession. . . . Use the Armour Glandular Line in your work with absolute confidence.

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Dr. Naylor's Medicated Teat Dilators

A safe and dependable treatment for Spider Teats, Scab Teats, Cut and Bruised Teats, Obstructions and for keeping teat canal open after operating.
Dr. Naylor Dilators fit either large or small teats without overstretching or tearing, are easy to insert and stay IN the teat. They carry antiseptics and healing agents into teat canal to combat infection and promote healing. The dilators themselves are Sterilized, Soft, Absorbent dressings which protect the inflamed area, absorb inflammatory exudates and keep teat canal open in its natural shape while tissues heal.

Price to Veterinarians

Dollar Package (contains 48 Dilators).....$8.00 Per Doz.
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←Plain Dispensing Package (contains 15 Dilators)..... 3.00 Per Doz.

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California License Examination

The next examination to candidates for license to practice veterinary medicine in California will be given in Los Angeles on June 20, 21 and 22, 1938. Applications from graduates of domestic schools must be in the hands of the Secretary at least 30 days prior to the examination and 90 days in the case of applicants from foreign schools.

NELSON E. CLEMENS,
Secretary, Board of Examiners
in Veterinary Medicine.
Hayward, Calif.

Harry W. Shoening, chief of the pathological division of the Federal Bureau of Animal Industry stated at the meeting of the Iowa Veterinary Medical Association, Des Moines, January 24-26, that 180,000 cases of infectious equine encephalomyelitis occurred in twenty-two states in 1937.

Farmers attending farm and home week program at the Iowa State College, February 10th, were warned by State Veterinarian H. E. Sidell to expect a severe outbreak of infectious equine encephalomyelitis next summer in districts where only a few cases of the disease occurred last year.

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YOU CAN USE
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Pet Animal Practitioners' Association

A group of 34 veterinary practitioners interested in small animal practice met at Hotel Burlington, Burlington, Iowa, February 24. They formed an organization to be known as The Iowa-Ill.-Mo. Pet Animal Practitioners' Association. The object of the association is to provide technical programs for veterinarians interested in small animal practice and put on small animal clinics. This is to supplement the work of sectional and state veterinary associations.

The officers elected were: J. H. Krichel, Keokuk, Ia., President; G. R. Clark, Hannibal, Mo., Vice-President; C. L. Meginnis, Peoria, Ill., Secretary-Treasurer. Trustees, John B. Bryant, Mt. Vernon, Ia., and H. R. Hornbaker, Galesburg, Ill.

The technical program included: Epileptiform Convulsions by C. M. Collins, Ottumwa, Ia.; Sulfanilamide in Small Animal Treatment by Fred J. Crow, Iowa City, Ia.; Drainage of the Ossa Bulla by H. R. Hornbaker, Galesburg, Ill.; Clinical Examinations and Demonstrations with Patients and Owners by C. L. Meginnis, Peoria, Ill., and Gastroenteritis by Oliver T. Douglass, Davenport, Ia.

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The "Sheep Practice" booklet contains about 50% more material than the special issue of VETERINARY MEDICINE on that subject. Note that it was compiled and edited by Dr. E. T. Baker, Moscow, Idaho, the most popular writer on this subject in America.

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To disinfect contaminated wounds; to prevent the infection of clean wounds; and to do so without injuring the formative cells, has been the surgeon's dream since Pasteur demonstrated the morbigenic action of microörganisms and Lister proved their relation to wound diseases.

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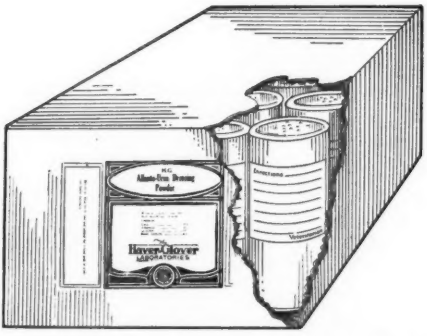

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Price per bottle..$2.00
Three bottles 5.00

Free Sample. To Every Veterinarian that has not received a sample, we will gladly send postpaid a liberal sample upon request. No obligation.

DETROIT VETERINARY SUPPLY CO.
Detroit, Michigan
Canadian Branch, Windsor, Ontario

Fistone First

Thousands of unsolicited letters in our files testify to the efficacy of this supreme antisuppurant.

Fistula of the Withers, Poll Evil, Quittor, Nasal Gleet, Chronic Metritis, Catarrhal Endometritis and other localized Pyogenic ailments of domestic animals have been successfully treated with Fistone by thousands of practising Veterinarians in the United States, Canada and England.

The universal success of Fistone in the cases of Fistulous wounds of horses and cattle has called forth a host of imitations, but only the genuine invites rigid investigation.

85% of Fistulous cases respond to Fistone! Ask Us!

COUPON

The Fistone and Appliance Company,
College Corner, Ohio.

Enclosed please find check for $8.00, for which send me one dozen 12-ounce boxes of Fistone (trial order) once only. (Regular price $10.) One-half dozen boxes $5.00.

Dr. .....

Address .....

The officers elected for the ensuing year at the annual meeting of the Nevada Veterinary Medical Association at Reno, Jan. 28, 1938, are: L. R. Vawter, Reno, president; Geo. E. Bainberger, Reno, vice-president, and Warren B. Earle, Reno, secretary-treasurer.

Sans-culotte

I note in the February, 1938, issue of VETERINARY MEDICINE, page xxv, under caption "Don't Say Cow Kicked Backward," a short article with reference to a milker being refused a claim on the grounds that a cow "can't kick backward."

Like Doctor Statter, of Sioux City, Iowa, I wonder if the California veterinarians who testified ever did any tuberculin testing or, in fact, have had much to do with cattle at all?

Wild Aberdeen Angus stock aren't the only ones that can, and do, kick backward. An ordinary, tame, old family pet Holstein once kicked straight to the rear and connected with me in a manner to lift me clear off the ground, send me ten feet out through a door and land me in the barn yard with all the buttons jerked off my trousers and those useful articles of clothing lying in a heap about my feet.

Whether or not Mr. Guidotti was defrauded I don't know, but the "expert" testimony was certainly wrong.

EARL F. GRAVES.

Denver, Colorado.

HARLTON'S LIQUID BLISTER *and* FREE BOOKLET

Easy to apply. Saturate on with hand—no rubbing. Doesn't burn, set skin "on fire," kill hair, or scar. Head let down in few hours. No rest necessary in many cases. Vary application to produce just degree of counter-irritation needed. Diluted with oil, makes any strength liniment desired. FREE SAMPLE—a $1.00 bottle sent free postpaid upon request if you have never had one .... treats several cases. It doesn't pay to be without this convenient, effective and economical preparation; write for sample or mail order today. 4-oz. size, $1.00; 16-oz., $3.00.

Detroit Veterinary Supply Co.
460 West Jefferson Avenue, Detroit, Michigan
Canadian Branch, 139 Sandwich St., Windsor, Ontario

The Best Milk for Children

Children given pasteurized milk are safer from communicable diseases and, at the same time, they grow equally well as compared with those who drink the raw product.

In 1930 two pieces of research work, one from America and the other from England, received much notice. These showed that rats fed on cooked milk did not grow as fast as those fed on raw milk.

Milk dealers selling raw milk gave these reports the widest possible publicity, hoping to create enough public sentiment to save the expense of improving their milk plants. The propaganda work was pushed so thoroughly that it came to the attention of the United States Public Health Service, which undertook to investigate the subject.

It selected forty American cities in its field of operation. The health, size, weight, rate of growth, physical development, and freedom from communicable diseases of 3,600 children were investigated. One-half of these drank raw milk. The other half drank pasteurized milk, and had done so for months or years—that is, during all the period that had any bearing on this question. The two groups were, practically speaking, on a par as to race distribution, age, location, financial status, and home influences. All foods other than milk, as well as that food, were also investigated.

The conclusion was that the children fed on cooked milk grew as fast, kept as fit and were as healthy as those fed on raw milk.

The report takes the heart out of the selling campaign. The final conclusion is that the American child from ten months to six years of age does not need raw milk for his health's sake. If there be any difference in food value in favor of raw milk, as the rat experiments seemed to show, the deficiency is met by the mixed diet which children of those ages always take.

A study of the foods eaten by the children in the two groups showed that they ate about the same things and in about the same amounts. The foods reported on were grouped into cereals, fruits, vegetables, fresh meats, eggs, potatoes, candies, and sirups.

There was a difference in cod liver oil. The children fed cooked milk took larger quantities of this oil. On the other hand, the indications were that cooked milk was safer than raw.

The diphtheria rate of the cooked milk group was 17; of the raw milk 22. The rates for scarlet fever were 23 for the cooked milk group and 41 for the raw. In the diarrheas of infancy, including those types that milk might cause, the cooked milk group had a rate of 111 and the other of 196. There were three cases of typhoid in each group. The rickets rates were: Cooked milk group, 31; raw group, 51. There were two cases of scurvy in the cooked milk group and one in the other.—*W. A. Evans in the Chicago Tribune.*

Sulfanilamide Promising in Bang's Disease

Sulfanilamide and the chemically related substance, Prontosil, which have yielded spectacular results in both human and veterinary medicine in the treatment of certain types of streptococcus infection, has, according to Richardson and Francis in a British medical journal—*The Lancet*—produced equally dramatic cures in a limited number of stubborn cases of undulant fever treated in the Children's Hospital in Southampton and St. Bartholomew's Hospital, London.

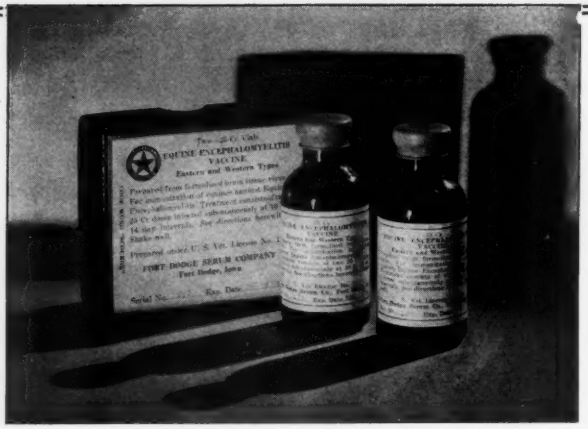
R. F. Montgomerie of the Wellcome Physiological Research Laboratories (England), in experiments with guinea pigs and goats, obtained most encouraging results in the treatment of artificially infected animals. Four guinea pigs were injected with massive doses of a highly virulent strain of *Br. abortus* and the disease allowed 30 days in which to establish itself, after which, treatment with sulfanilamide was commenced. Twenty-one days later, three of the guinea pigs had entirely eliminated the organisms and the infection was materially reduced in the fourth. Cultures from the spleens of all control pigs showed abundant growth of *Br. abortus.*

A goat was infected by feeding the organisms, instilling them into the conjunctivæ and injecting cultures into each quarter of the udder. After 76 days, when the agglutination titre was high and the milk contained approximately 100,000 organisms per cc, oral treatment with sulfanilamide was commenced, 10 grams being given daily for six days. After the third dose, the number of brucella abortus organisms in the milk had fallen to one to three colonies per cc. During the 14 days following treatment, no organisms could be found in the milk. Reinfection of the udder was then attempted by injecting a suspension of organisms into each quarter. Organisms too numerous to count were found on the first day after the injection. Following that, the number fell rapidly until they entirely disappeared after the eighth day, and the milk continued free from brucella organisms thereafter to the end of the experiment.

The experiment was repeated in a second goat, with approximately the same results. A record of both experiments was published in a recent issue of *The Veterinary Record.*

The foregoing results, both in man and animals, amply justify further investigation of this matter. The day will be eagerly welcomed when a veterinarian can tell the owner of an animal infected with Bang's disease to do something other than slaughter it.

Streamlined trains were developed by automobile men; airplanes by bicycle repair men; the telegraph by a portrait painter; the telephone by an elocutionist. Pasteur was not a doctor; Bessemer was not a steel maker; Carnegie was a railroad man; Gary was a lawyer; McCormick (reaper) a machinist; Eastman (kodaks) a bank clerk and Whitney (cotton gin) a law student.



Maximum protection!

FORT DODGE ENCEPHALOMYELITIS VACCINE

Over 99% of all horses immunized with FORT DODGE Encephalomyelitis Vaccine before the 1938 outbreak season should be adequately protected against field exposure. This extremely high efficiency is indicated by last year's two-dose vaccination of over 65,000 head by 170 veterinarians replying to a recent questionnaire. Specify Fort Dodge and enjoy the peace of mind that comes from using a ***field-tested*** product —a product backed by extensive research and adequate production facilities. We will be glad to send you a Free supply of informative leaflets for client-distribution.

Single-treatment package, two 25 Cc vials (Western or Eastern type) ..... $ 2.50
10-dose bulk container, 250 Cc vial (Western or Eastern type).... 10.00

Prices less 10% trade, 2% cash discounts

FORT DODGE LABORATORIES, INC.
FORT DODGE, IOWA

AGENTS WANTED

Several desirable locations are available for enterprising agents to distribute Strasenburgh veterinary products.

Established in 1886, we have manufactured the finest quality veterinary pharmaceutical products for over half a century.

If you are interested in handling the Strasenburgh line, please write fully as to your qualifications and the territory you would be able to serve.

R. J. STRASENBURGH CO.
Rochester, N. Y.
Pharmaceutical Chemists Since 1886

Send for veterinary pharmaceutical catalog.

Albert L. Brown, for the past three years director of the New York State Fair, has been transferred to the state department of agriculture and will become supervising veterinarian for the department and will direct all field activities in connection with the state campaign to eradicate Bang's disease.

Six thousand chickens and five dogs were smothered to death by a fire in the Panhandle Veterinary Hospital and Hatchery, Amarillo, Tex., March 11, 1938. Many hospitalized dogs and several cats were rescued.

Twin calves are by no means rare, but a Holstein cow in Wooster, Ohio, holds the record. She has given birth to six consecutive sets of twins in the last eight years.—*The Nat'l Humane Rev.*

Oklahoma License Examination

The Oklahoma Board of Veterinary Medical Examiners will hold an examination at the State Capitol Bldg., Oklahoma City, June 29-30, 1938, for license to practice veterinary medicine in that state. The fee for examination is $15.00; for license by reciprocity, $25.00. Good locations are said to be available in Oklahoma. Application blanks for the examination may be obtained by addressing Dr. Samuel R. Espy, Secretary, 125 West 23rd St., Oklahoma City, Okla.

A GREAT CONVALESCENT FOOD

Vitality Dog Food

Suggested by Veterinarian

"I have found VITALITY the most palatable of any of the foods I have tried on shy feeders. Our clients continue to buy it and report good results. Need I say more?"

Dr. H. Rudman, Union, N. J.

It speeds up recovery of many sick dogs because it is easily digested. Rich in meat, it imparts strength to dogs and builds up resistance quickly. Mix your favorite meat with it if you wish —you won't tear down its balance, yet, you are assured that your dogs will get milk solids, essential minerals, vitamins and properly dextrinized cereals so necessary to good intestinal flora. Many Veterinarians like Dr. Rudman use and recommend *Vitality Dog Foods.* Many of them add $100.00 a month or more to their income by selling *Vitality.* If you want to increase your income, write for our special *Veterinarian Offer.*

VITALITY MILLS, INC.

Dept. VM-5, Board of Trade Bldg., Chicago, Ill.

We do not manufacture remedies and we always advise dog owners to see a reliable Veterinarian for medical service.

"THANKS TO WEEN"

WEEN is filling a very definite need in the field of puppy feeding and dog conditioning. Hundreds of letters from grateful WEEN users throughout the country testify to this fact. Their "Thanks to WEEN" cover many nutritional benefits received from feeding WEEN. In many cases WEEN has saved puppy lives. In others WEEN has helped to condition stud dogs; to fortify bitches before, during and after the nursing period, and to assure good general health, resistance and vigor when present in the diet of growing and adult dogs.

WEEN is a *liquid* food developed to provide a satisfactory replacement for bitches milk. Based on new knowledge of nutritional requirements, it contains ample amounts of *all* of the vitamins needed for best normal growth and development. These include Carotene, Vitamin D, Vitamin E (contained in wheat germ oil), Vitamin F, Vitamin B-1 and the Vitamin B-2 (or G) complex: Lactoflavin, B-6, Blacktongue factor and others.

WEEN is easy to use and priced low enough for routine feeding. May we send you the complete facts about WEEN and let you judge for yourself?

Life Products, **INC.**
5th floor, Cook Bldg.
46th & Prospect Aves. **Cleveland, O.**

WEEN

A Liquid Food For
PUPPIES

Our Debt to Animals

Civilization owes such a tremendous debt to man's animal friends that we can truthfully say that without them we would not have civilization. We would not even be existing. For centuries it was the ox which helped man to plow the field, making possible his material existence. For centuries it was the horse that carried man on explorations to the widening of his horizons; that bore him into battle against more savage invaders which threatened his home and family; that enabled him to undertake the chase which furnished him with food and clothing. For all time it has been the cow or the goat which has been the foster-mother of the race; it has been the dog which has been man's constant companion when other men have failed him, his able auxiliary in the hunt, the alert guardian of his herds and flocks; his protector from the dangers of primitive conditions. It has been the faithful dog which has watched over his children, his house, his possessions, and been eyes to the blind and ears to the deaf. And the birds—who can measure their assistance as seed-carriers and pest-destroyers.—*Rev. M. L. Kain,* Rector of All Saints Episcopal Church, San Diego, California.

The Eighth Annual All-Day Practitioners' Clinic of the Eastern Iowa Veterinary Association will be held June 21, 1938, at Mechanicsville.

For Better . . . Faster . . . Easier Dog Clipping

The NEW STEWART CLIPMASTER

New Easy-Grip handle only 2" in diameter

Veterinarians who have tested the new Clipmaster say it is the finest, fastest, easiest to use dog clipper of all time.

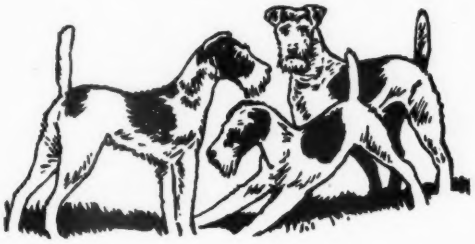
Clipmaster has powerful, air-cooled, ball bearing motor inside the special composition handle. Perfect balance for clipping in any position.

WHAT USERS SAY

"Got a compliment on every dog I clipped with Clipmaster."
"Paid for itself the first week I had it."
"Clipped 73 dogs without resharpening."
"Gave excellent service on 300 dogs last summer."

Clipmaster complete with 20 feet of cord, for use on any 110-volt A. C. or D. C., only $17.95. For other voltages $18.95. (Slightly higher West of Denver.) At your dealer's or send us $2.00. Pay balance on arrival. Write for catalog showing complete line of STEWART clipping and shearing machines. Made and guaranteed by Chicago Flexible Shaft Co., 5516 Roosevelt Road, Chicago, Illinois.

48 YEARS MAKING QUALITY PRODUCTS



Looking For A "Fool Proof" PUPPY FOOD?

Unquestionably, you can tell a puppy owner what he should feed—and how much of each food to use. However, to get the essential vitamins and other growth promoting factors, your list of recommendations must be quite long. Then will the puppy owner take the time and make the effort to follow your directions? If not, who will be blamed?

Gaines Meat & Milk Meal makes your task easier. Instead of recommending many things—meat, eggs, milk, vitamin carriers and so on—you say "Gaines Food" which has them all in scientifically correct proportions. It's an almost "fool proof" puppy ration.

Samples Will Gladly Be Sent You, Together With Our Veterinary-Dealer Proposition If Your Territory Is Still "Open".

GAINES REINDEER MEAT HAMBURG

Is a definite hit. Contains whole carcasses of dressed reindeer meat without cereals or vegetables. Ask for details about this new canned food.

GAINES FOOD CO.

SHERBURNE, N. Y. **BOX H-5**

WAREHOUSES: SEATTLE—SAN FRANCISCO—LOS ANGELES—HOUSTON—KANSAS CITY—ROANOKE—TORONTO.

On the Job

The Eastern Iowa Veterinary Association draws a hand, for its motto, and for its long and useful activities. Its motto runs:

"To help make Eastern Iowa the safest place in the world to invest money in live stock."

The oldest and the largest sectional veterinary association in the world, is the claim made for it, and so far as we are aware, justly made. The association has a definite, practical program which it presses constantly, and through its persistent publicity does much to prevent animal disease and its spread. Thus a statement just issued to the newspapers:

"Hog cholera has recently created considerable havoc among the droves of hog raisers in several sections of eastern Iowa where the disease for many years has struck the least. In regions where there are so many cholera-susceptible swine, hog cholera makes fast and devastating progress through the countryside. Owners of susceptible swine in all sections should suspect hog cholera first when their droves sicken at this time of year."

What kind of a live stock industry in this country today, think you, without the study given to animal diseases by a competent, well trained veterinary profession? Who discovered how to stop hog cholera for instance?—*Daily Drovers Journal*, Oct. 5, 1937.

Dr. Naylor's Medicated Teat Dilators

A safe and dependable treatment for Spider Teats, Scab Teats, Cut and Bruised Teats, Obstructions and for keeping teat canal open after operating.
Dr. Naylor Dilators fit either large or small teats without overstretching or tearing, are easy to insert and stay IN the teat. They carry antiseptics and healing agents into teat canal to combat infection and promote healing. The dilators themselves are Sterilized, Soft, Absorbent dressings which protect the inflamed area, absorb inflammatory exudates and keep teat canal open in its natural shape while tissues heal.

Price to Veterinarians

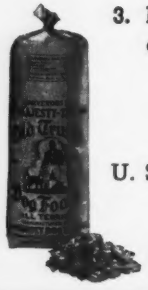
Dollar Package (contains 48 Dilators).....$8.00 Per Doz.
Fifty Cent Package (contains 18 Dilators)..... 4.00 Per Doz.
←Plain Dispensing Package (contains 15 Dilators)..... 3.00 Per Doz.

H. W. NAYLOR CO. MORRIS, N. Y.

EXTRA DIVIDENDS

When You Feed Ideal DOG FOOD

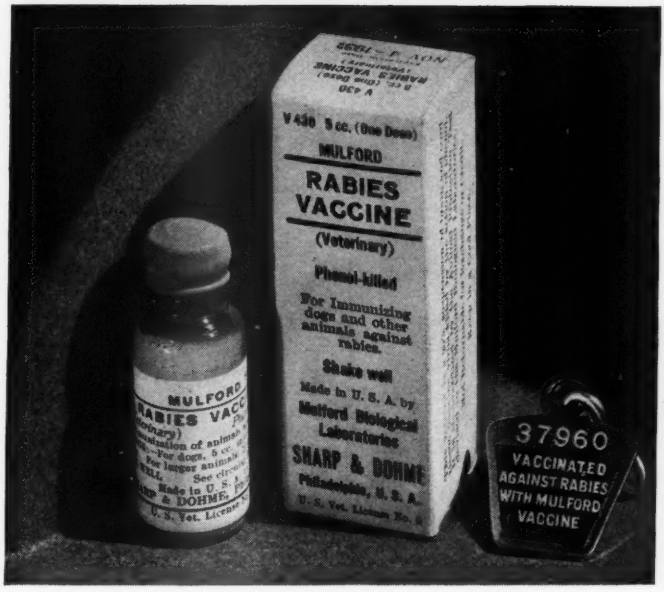
1. **IDEAL is a quality product assayed under the Wilson fellowship at a leading midwestern university.**
2. **IDEAL is Super-charged with food value, offering more nutritional value per pound at no extra cost.**
3. **IDEAL offers many beautiful, nationally advertised Gifts in exchange for labels.**



WRITE FOR FREE GIFT CATALOG NO. 2

U. S. Yards WILSON & Co. Chicago, Ill.

Wilson & Co. are distributors of Old Trusty Dog Foods



Protective value against rabies demonstrated by animal-protection tests!

ACTUAL *animal-protection tests* demonstrate the protective value of Mulford Rabies Vaccine Veterinary (Phenol-Killed), thus definitely establishing the effectiveness of this vaccine in protecting against rabies.

These tests were conducted in accordance with the method developed by Reichel and Schneider and reported by them at meetings of the American Veterinary Medical Association and American Public Health Association.

Mulford Rabies Vaccine (Phenol-Killed) is a 20% finely divided, uniform, brain-and-cord-tissue suspension of killed rabies virus. It is supplied in the following packages:

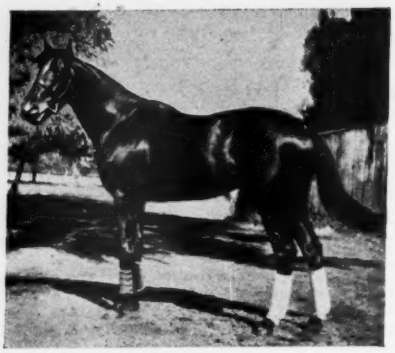
V 430-100	One 5-cc. vial
V 430-95	Six 5-cc. vials
V 430-67	One 50-cc. bottle

A metal tag and vaccination certificate are supplied with each dose.

"For the Conservation of Life"

MULFORD BIOLOGICAL LABORATORIES

PHILADELPHIA **SHARP & DOHME** *BALTIMORE*



DAVENIL

Controls Acute Respiratory Infection in a Race Horse

Frank Porter Miller, M.D., owner of Payne, sends us the following case report with snap-shot, and we appreciate very much his permission to publish it here:

"On July 8, it was our intention to enter Payne in a $2,000 claiming race to be run at Del Mar on the fifteenth of the month. A day later we observed that he had developed an acute respiratory infection, and it appeared that he would be unable to run.

"In this predicament we were thankful for our knowledge of the quick action of Davenil in this type of infection. We gave a 10-cc. injection daily for three days. The case cleared up beautifully. Payne went to the post fit as a fiddle and ran to win in a dead heat, at the track odds of thirty to one."

Since this communication was received, Payne has run in eight races at Santa Anita, California, finishing in the money five times.

Davenil is available in bottles of 10 cc. and 50 cc. If you are not familiar with it, write for testing supplies.

SPICER and COMPANY

GLENDALE, CALIFORNIA

NEW YORK CHICAGO DALLAS PORTLAND

O. T. Douglas, Davenport, Ia., has been appointed meat and food inspector of Davenport, to fill the vacancy caused by the death of Fred H. Hassenmiller. Doctor Douglas is a partner in a pet animal hospital in Davenport and is one of two who passed a city civil service examination for this position several months ago.

Deaths of Veterinarians

G. W. Butler, 79 (B. A. I., retired), Indianapolis, Ind., Jan. 3rd; O. E. Dyson, 72 (B. A. I., retired), St. Petersburg, Fla., Jan. 30th; James O. Fenstermacher, 58, New Tripoli, Pa., Feb. 24th; Delbert B. Easley, 62, Chautaqua, Kans., Feb. 25th; Samuel Broad, 76, Chesterton, Ind. (automobile crash), Feb. 26th; Sam Francis Ferrel, 88, Lakehurst, N. J., Feb. 27th; George Olds, 77, Hartford, Mich., Feb. 28th; John M. Wheeler, 60, Blaine, Ky., Feb. 28th; James Fleming, 71 (B. A. I., retired), Rochelle Park, N. J., March 3rd; L. L. Stier, Grand Mound, Iowa, March 5th; E. M. Fales, 67, Edmore, Mich., March 6th; F. H. Hassenmiller, 59, Davenport, Iowa (injury due to fall), March 10th; Ray Reynolds, Elkland, Pa. (Angina), March 13th; John H. Schrader, 44, Oxford, Iowa, March 14th; Frank S. Beatti, 74, Iola, Kans., March 17th; William E. Connelley, 73, Medical Lake, Wash., March 17; Francis H. Moreland, 61, Chicago, March 23.

Periostine

Horse Back To Work in Three To Five Days

It is a powerful antidote to inflammation occurring in the periosteum, articulations, bursæ, tendons, ligaments; also where there is pain, exostosis or lameness. Usually only one application is necessary. One bottle is sufficient to treat three or more cases.

Endorsed by almost every veterinarian that has given it a trial.

FREE Booklet—"Reminders in Diagnosing Obscure Lameness."

Price per bottle..$2.00
Three bottles 5.00

Free Sample. To Every Veterinarian that has not received a sample, we will gladly send postpaid a liberal sample upon request. No obligation.

DETROIT VETERINARY SUPPLY CO.
Detroit, Michigan
Canadian Branch, Windsor, Ontario

GONADIN

opens entirely new fields for the wide awake practitioner

The tremendous sex stimulating action of Gonadin makes possible:

The production of early spring lambs ahead of the market, and a shorter lambing season;

The prevention of "missing" in valuable brood mares, and reestablished vigor in stallions;

Increased calf crops in beef herds and lengthened service life of bulls;

Controlled breeding in dairy cattle, tending toward a more constant milk supply;

The breeding of certain types of "hypo-functioning" females, in small animal practice, and increased vigor in males on the edge of senility.

CUTTER LABORATORIES BERKELEY CALIF.

Sprains, Contusions and Inflammatory Lesions in the Legs of Horses

The feet and legs of race horses, which are subjected to severe exertion, need the constant care of the veterinarian. Sprained and contused tendons, soreness or stiffness of the legs are common conditions requiring prompt and skilful treatment.

Lesions of this type and of all those presenting symptoms of acute inflammation and congestion, require the application of prolonged moist heat to reduce the inflammation, relieve the pain and avoid stiffness. No measure for applying prolonged moist heat is so satisfactory as Antiphlogistine.

Although Antiphlogistine is applied as a poultice, it is so much *more* than a poultice, because of its osmotic action. It not only maintains its heat for hours at a time, but the medication of its several ingredients render it capillary-stimulating, thermogenic, antiseptic, and nutrient to the tissues. It is an aid to encouraging early repair of an inflammatory lesion and is desirable, as well as painless, for direct application to an open sore or wound.—Adv.

BACTERIN THERAPY
and
EQUINE PRACTICE

Shipping fever or stockyards fever, strangles and pyemic arthritis are relatively common equine maladies that are more or less prevalent at this season of the year. Because of the extensive losses of horses and mules in 1937, there has been an excessive replacement during the spring of 1938, particularly on farms. Many of the replacement animals have passed through public markets and were exposed to various infections. Such animals may become affected and thus the farm animals become infected with shipping fever or strangles.

These diseases are of considerable economic importance because of the serious handicaps to the putting in of farm crops. It is not uncommon for all horses and mules on a farm to become affected with these diseases and thus cause suspension of all farm work.

Strangles is associated with Streptococcus infection and is prone to occur in colts. This malady is characterized by a febrile reaction and abscess formation.

Pyemic arthritis is essentially a disease of colts. The infection may be transmitted from the dam.

Shipping fever, strangles and pyemic arthritis can be controlled and the losses reduced to a minimum by the use of properly prepared bacterins.

Because of the widespread and frequent occurrence of these maladies, it is advisable to treat all farm horses and mules before spring work begins.

Kinsley's symbiotically prepared Influenza Bacterin has been used successfully for years, not only on farms, but also in public markets. One injection usually suffices as a preventive agent for unexposed animals. Two or more injections should be given to exposed animals.

Our Streptococcus bacterin is par-excellent in the control of colt strangles and pyemic arthritis bacterin is of value in controlling navel ill.

Write, telephone or telegraph. Phone—Logan 4600.

KINSLEY LABORATORIES,

1103 East 47th Street, Kansas City, Missouri

VITOL in General Practice

Reg. U. S. Pat. Off.
(McKenna)

Vitol is a treatment for avitaminosis and mineral insufficiency in all domestic animals

Like the principal underlying vitamin-mineral therapeusis, Vitol has long since passed the stage of experimentation. Experimental demonstrations and clinical tests preceded its introduction to the veterinary profession by more than four years.

In addition to critical bio-assays in dogs and young animals of the large species, the findings were proved in kennels, small animal hospitals, stables and ranches. It is logical to use Vitol on a large scale in veterinary medicine as there is abundant evidence to the effect that vitamin deficiency is a dominant factor in the incidence of disease and death rates.

Vitamin A builds up resistance to respiratory infections (McCollum, 1917, Bloch, 1931, Ellison, 1932); vitamin B, to digestive and nervous disorders; vitamin C to streptococcic infections (Findlay, 1923, Moody and Jackson, 1927); and so one may continue through all the references on each ingredient of Vitol.

Vitol contributes Calcium, Phosphorous, Iron, Manganese, Iodine and Vitamins A, B, C, D, E and G in proper ratio.

Indications for the use of Vitol are many because the administration of this special vitamin-mineral combination is distinctly beneficial in a very wide range of cases.

Vitol (McKenna) Is Reasonably Priced

5-lb. cans, less than six	**$ 2.20**
6 5-lb. cans	**12.00**
24 12-oz. cans	**12.00**
100-lb. barrels	**35.00**

Leading Veterinary Supply Houses Distribute Vitol

PRODUCED BY

Vitol Company

3684 BEVERLY BLVD., LOS ANGELES

Literature on Request

May we send you **FREE** *the new*
SQUIBB VETERINARY HANDBOOK ?

and Price List; describing in detail almost 200 Veterinary Specialties; in many cases with indications and recommended dosages; quoting regular veterinary hospital discount prices.

E. R. SQUIBB & SONS, 745 FIFTH AVENUE, NEW YORK
Veterinary and Animal Feeding Products Division

GUARANTEED TO GIVE SATISFACTION

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ACCEPTED AND USED BY THE PROFESSION SINCE 1900

IN THE TREATMENT OF SPLINTS, SPAVINS, SIDEBONES, CURBS, INFLAMED TENDONS, BURSAL LAMENESS, ETC.

"M. A. C. HAS NEVER BEEN SUCCESSFULLY IMITATED"

CARTER-LUFF CHEMICAL CO., HUDSON, N.Y.

PRICES

SINGLE BOTTLE $ 2.00
¼ DOZEN
1 BOTTLE FREE 5.00
½ DOZEN
2 BOTTLES FREE 8.00
1 DOZEN
4 BOTTLES FREE 15.00
2 DOZEN
4 BOTTLES FREE 25.00

AGENTS SOUTHERN STATES
Kentucky Serum Co.
LOUISVILLE, KY.

FOR PRICES IN CANADA
WRITE TO
Wingate Chemical Co.
MONTREAL

Oklahoma Veterinary Meeting

The 23rd semi-annual meeting of the Oklahoma Veterinary Medical Association will be held in Tulsa, June 20-21, 1938. Headquarters at the Hotel Tulsa.—F. Y. S. Moore, McAlester, Secretary-Treasurer.

Nueces County (Texas) hogs are under quarantine by the state veterinarian because of the prevalence of swine erysipelas.

In RACE HORSES and all THOROUGHBREDS or just plain DOBBIN

—it makes no difference—the use of Antiphlogistine is **always** a safe and usually a most efficacious means of treating all acute inflammatory lesions.

Nail Pricks, Synovial Swellings, Wind Galls, Harness Injuries
Infected Sores, Sprained and Strained Tendons
Lameness following a hard Work-out

all are satisfactorily treated with applications of Antiphlogistine, renewed daily if necessary.

ANTISEPTIC DECONGESTIVE **Antiphlogistine** REPAIR-STIMULATING

Sample on request

THE DENVER CHEMICAL MFG. CO., 163 Varick St., New York

A UNIQUE AND VERY ECONOMICAL ANTISEPTIC

Developed on an entirely new chemical basis . . . contains no phenol, iodine, mercury, or other heavy metal

ZEPHIRAN

Trademark Reg. U. S. Pat. Off.

Brand of DIALKONIUM

Mixture of High Molecular Alkyl-Dimethyl-Benzyl-Ammonium Chlorides

- Very Economical in Use;
- High Bactericidal Potency;
- Non-poisonous—Non-Irritating;
- Low Surface Tension—Deep Penetrability;
- Wide Scope of Usefulness;
- Great Rapidity of Action.

EFFICIENT ANTISEPTIC FOR SURGICAL AND OBSTETRICAL PROCEDURES

•

General Antiseptic for the Disinfection of Skin . . . Mucous Membranes . . . Deep Wounds . . . and Instruments.

Literature and Information Concerning NEW TERMS Sent Promptly On Request

Available as

ZEPHIRAN AQUEOUS SOLUTION: 1:1000
ZEPHIRAN STAINLESS TINCTURE: 1:1000
ZEPHIRAN TINTED TINCTURE: 1:1000
in 8 ounce and 1 gallon bottles

ALBA PHARMACEUTICAL COMPANY, INC.
New York, N. Y.—Factory: Rensselaer, N. Y.

Exclusive Distributors for the Veterinary Profession:

WINTHROP CHEMICAL COMPANY, INC.

Pharmaceuticals of merit for the physician and veterinarian

170 VARICK STREET NEW YORK, N. Y.

600 V

Member of Veterinary Exhibitors' Association

PROTECT AGAINST ENCEPHALOMYELITIS

Vaccinate Early!

Of 10,392 horses twice vaccinated thirty days before the 1937 encephalomyelitis outbreak, 99.46% were protected. Of the 46,440 vaccinated during the epizootic, 92.99% were protected. (Jan. 26, 1938 U. S. B. A. I. report)

Order Encephalomyelitis Vaccine (Cutter's) from Norden

Prepared after method of Shahan and Giltner

NQW—1 immunization, 2-25 cc doses, Western.....$2.50

NQE—1 immunization, 2-25 cc doses, Eastern.....$2.50

NEW 250 cc vial (10 doses).....$10.00

Day or Night Service from Norden

Branches and Distributors

OHIO .....Columbus
WISCONSIN .....Milwaukee
IOWA.....Davenport, Des Moines, Sioux City
MINNESOTA.....Minneapolis, New Ulm
TEXAS .....Ft. Worth
NEBRASKA.Lincoln, Grand I., Norfolk, Superior
KANSAS .....Wichita
INDIANA .....Indianapolis
CANADA.....Oshawa, Ont.

Mailing Cards and literature available on request

NORDEN LABORATORIES
LINCOLN · NEBRASKA

MASON'S *Kennel Fences*

Best for Dog Hospitals and Boarding Kennels

$69.55 and up

Mason's are Real Kennel Fences—Strong, Good Looking and sold under a Money Back Guarantee to hold the largest and strongest dogs. Used and approved by best Kennels everywhere.

SEND FOR FREE CATALOG

Describing Permanent and Movable Dog Fences, Kennel Stalls, and Gates at Low Direct Factory Prices.

MASON KENNEL FENCE CO., Box 77, Leesburg, Ohio

Five state veterinarians contributed to the program of the annual meeting of the Arkansas Veterinary Medicine Association, Hot Springs, Arkansas, March 7th: Hugh Curry, Missouri; T. O. Booth, Texas; E. S. Brashier, Mississippi; H. C. Rinehart, Illinois and C. D. Stubbs, Arkansas.

The Illinois Veterinary Medical Association had its fifty-sixth annual meeting in Springfield February 17-18, and adopted a resolution favoring the establishment of the Veterinary College in Illinois.

The Mississippi Valley Veterinary Medical Association will hold its next annual clinic at Galesburg, Ill., May 26.—L. A. Gray, Bushnell, Ill., Secretary.

THE VETERINARY RECORD

Founded 1888

A weekly journal for the Profession.

Published by the

NATIONAL VETERINARY MEDICAL ASSOCIATION

of Great Britain and Ireland

36 Gordon Square

LONDON W. C. 1.

ENGLAND

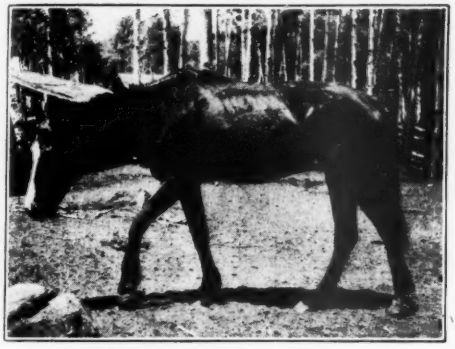
Subscription, £2.12.0 per annum.

ANEMIC STRONGYLOSIS

Treating horses and mules loaded with blood-sucking Strongyloides by merely giving them a dose of oil of chenopodium or carbon tetrachloride leaves the job half done.

To keep abreast with the times, one must attack the worms remaining after the single dosing; but what is still more important is rebuilding the depreciated blood values—the anemia which, says Hirleman (*Veterinary Medicine*, Apr. 1938) is often mistaken for infectious anemia (swamp fever).

Keeping the worm burden down with well-calculated, anthelmintic, tonic and hematopoietic medication, not only prevents massive reinfestation but overcomes the anemia, the unthriftiness, the weakness, the diarrhea, the edema, which make up the clinical syndrome. For this purpose depend upon:



H–G ANTHELMINTIC POWDER

(Equine)

Package 1 dozen 16-ounce cans..$3.50; 5-pound can..... $1.50
25-pound drum ..... 4.75; 100-pound drum 15.00

According to the plan long since developed by the clinical staff of the Haver-Glover Laboratories, single dosing not followed up with a blood-building, tonic, anthelmintic powder given in the feed and sensible hygienic measures, does not master the "strongyle" menace on any farm.

This Anthelmintic Powder Alone Is Scientific Treatment for Equine Strongylosis and Classical Medication for the Associated Anemia

The **Haver-Glover** *Laboratories*

KANSAS CITY, MO.

(and Service Branches)

NEW YORK, N. Y. **ATHENS, ALA.** **DALLAS, TEXAS** **SAN FRANCISCO, CAL.**
LANSING, MICH. **CHICAGO, ILL.** **CHAMPAIGN, ILL.** **LOS ANGELES, CAL.**
ALBANY, GA. **DENVER, COLO.** **OREGON CITY, ORE.**

Member of the Veterinary Exhibitors' Association

NOVIDOL

Patent Pending

Vaporizable - Non-Irritating Iodine

When NOVIDOL is given orally, the body heat causes the vapor of non-irritating iodine to be given off gradually. We are literally able to paint atomistic iodine over the whole gut.

When you want IODINE—use NOVIDOL externally, internally and eternally.

Marketed in Pints only
Literature on Request

IODINE PRODUCTS COMPANY

Manufacturing Chemists

410-12 E. Rittenhouse St., Philadelphia, Pa.

HARLTON'S LIQUID BLISTER *and* FREE BOOKLET

Easy to apply. Saturate on with hand—no rubbing. Doesn't burn, set skin "on fire," kill hair, or scar. Head let down in few hours. No rest necessary in many cases. Vary application to produce just degree of counter-irritation needed. Diluted with oil, makes any strength liniment desired. FREE SAMPLE—a $1.00 bottle sent free postpaid upon request if you have never had one . . . . treats several cases. It doesn't pay to be without this convenient, effective and economical preparation; write for sample or mail order today. 4-oz. size, $1.00; 16-oz., $3.00.

Detroit Veterinary Supply Co.

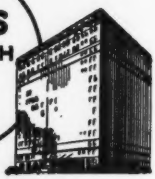
460 West Jefferson Avenue, Detroit, Michigan
Canadian Branch, 139 Sandwich St., Windsor, Ontario

Hospitality

FIRST and ALWAYS at

HOTEL MELBOURNE

400 ROOMS WITH BATH FROM $2.50 UP



RAY G. McGRATH, Manager

ST. LOUIS

LINDELL BOULEVARD AT GRAND

Ohio State Veterinary Conference

The Eleventh Annual Conference of the College of Veterinary Medicine, The Ohio State University, will be held June 15, 16 and 17, 1938. This year, as formerly, the program is quite an extensive one and includes some of the foremost veterinarians and educators in this country. The entire three-day period will be devoted to the discussion of topics of vital importance to every veterinarian who can be present on this occasion. A special effort has been made in arranging the details of the program so that its quality and variety will appeal to all veterinarians.

The program this year has been formulated for the purpose of giving to the practitioner the very latest developments in veterinary medicine. It is generally conceded that such intensive short courses provide necessary educational opportunities for the busy practitioner. The College of Veterinary Medicine hopes it will be possible for a large number to avail themselves of this opportunity to receive the very latest information concerning many of the real problems in their various fields of activity.

In past years the attendance at these annual conferences has been very gratifying to those interested in promulgating them. The interest manifested in the programs and the various discussions entered into by those in attendance has been a source of much gratification also. An invitation is hereby extended to all veterinarians to be present on this occasion to receive, we feel sure, much of value from an educational point of view.

O. V. Brumley.

Animal Disease Specialist Dies

Dr. John M. Buck, Superintendent of the Federal Animal Disease Station at Bettsville, Md., died suddenly May 2 from an apoplectic stroke. He was widely known as an investigator of animal diseases and was the author of many publications and scientific articles in that field. In recent years his work on Bang's disease was outstanding and greatly enriched veterinary literature.

Doctor Buck was born at Acton, Me., in 1878. Was graduated from the College of Veterinary Medicine of Ohio State University in 1907. He received an appointment the same year as veterinary inspector in the Bureau of Animal Industry and two years later was assigned to research work in the Pathological Division at the Bureau at Washington, D. C. Here he performed research work and other duties involving the preparation of blackleg vaccine, diagnostic work in connection with glanders, and the complement-fixation method of diagnosing dourine.

Since 1916 Doctor Buck has devoted his principal attention to numerous phases of the Bang's disease problem.

Army Veterinary Service

Transfers.—Lt. Col. Clifford C. Whitney, from Panama Canal Department to Fort Bragg, N. Car.; Lt. Col. Henry E. Hess, from Fort Bragg, N. Car., to Panama Canal Department, July 26, 1938; 1st Lt. Edwin L. Millenbruck, from Army Medical Center, Washington, D. C., to Field Service School, Carlisle Barracks, Pa., Aug. 5, 1938; 1st Lt. Fred L. Herring, from Carlisle Barracks, Pa., to Fort Geo. G. Meade, Md., June 6, 1938; 1st Lt. Lloyd C. Tekse, Fort Mason, Calif., to Presidio of San Francisco, Calif., May 17, 1938; Col. Daniel B. Leininger, from Fort Sill, Okla., to Fort Bliss, Texas, June 20, 1938.

Promotions.—Herbert K. Moore to lieutenant colonel, April 1, 1938, and John H. Rust 3rd, to captain, April 4, 1938.

Veterinary Reserve Corps

New Acceptances.—Major Ernest W. P. Hogg, Wilkes Barre, Pa.; and 1st Lts. Dwain T. Bowie, Chicago, Ill.; Andrew G. Koostra, Ocheyedan, Iowa; Wm. S. Monlux, Ithaca, N. Y., and John A. Utterback, Jr., Austin, Minn.

Separations.—1st Lt. Leigh H. Selley, New York, died May 30, 1937.

New Assignments to Active Duty with CCC.—1st It. Frank L. Chastain, Fort Bragg, N. Car.

Termination of Assignment to Active Duty with CCC.—1st Lt. Wm. G. Sullivan, Fort Bragg, N. Car.

Geo. S. Rey and his son, Robert S. Rey, a recent graduate of the Michigan State College, are erecting a ten-room small animal hospital at Visalia, California which will be modern in all respects.

Serum Companies Renew Publicity Campaign

Backing up their extensive farm paper and newspaper publicity campaign in the interests of the veterinary profession, the Associated Serum Producers this month are releasing an intensive radio campaign over fifteen leading stations.

The campaign started on Indiana and Ohio stations May 1, and on all other stations May 16. Primarily, the radio announcements will warn farmers that spring pigs should be immunized against cholera without further delay, and that for safety and protection, the vaccinating should be done only by a veterinarian. At least half the radio campaign will be devoted to pointing out the importance of the veterinarian's services, and the undue risk involved when the veterinarian is not called in for such professional service.

A spring advertising campaign to induce more farmers to have their hogs immunized against cholera by their local veterinarians this year, started in fifteen of the nation's largest farm magazines.

The campaign is being paid for by the Associated Serum Producers, and has been prepared by the American Foundation for Animal Health, the bureau organized by the Producers to carry on educational work in the interests of the veterinary profession.

The series of advertisements are scheduled to appear every two weeks through April, May, and June. Each of the advertisements stresses the fact that the only reliable vaccination is that performed by the local veterinarian, and that the farmer who wishes to avoid unnecessary risks should permit no one but his veterinarian to immunize his hogs.

The 1938 summer meeting of the Wisconsin Veterinary Medical Association will be held June 30 and July 1st. Headquarters will be at Voss' Birchwood Lodge, Manitowish (Iron County), Wisconsin.—B. E. Beach, Madison, Secretary.

Veterinary Class at Middlesex

Last year over 2500 qualified applicants sought admission to the 10 veterinary colleges in this country and Canada. There was room for less than 700 in their entering classes. This situation will be greatly improved this year, as far as New England is concerned, by the opening of the new department of veterinary medicine, at Middlesex University. The newly erected classrooms and laboratories will accommodate a large entering class, and high school graduates will be accepted for the one-year pre-veterinary college course. The increasing demand for services of scientifically trained veterinarians in private practice, as well as in State and governmental positions, makes this uncrowded field an attractive opportunity for a professional career.—*Boston Post,* Apr. 17, 1938.

Field Tested

Proved under all the hazards of practical usage in thousands of cases

FORT DODGE ENCEPHALOMYELITIS VACCINE

QUALITY-RELIABILITY-SERVICE

Use of this vaccine in two-dose pre-outbreak immunization of 70,953 horses held losses to only 5½ head per thousand. This is the report of 170 veterinarians who replied to the 1937 questionnaire of the Fort Dodge Laboratories.

Such a record—99% proven efficiency of Fort Dodge Encephalomyelitis Vaccine—enables you to specify "Fort Dodge" with confidence when selecting your 1938 vaccine. A field tested, biologically standardized product, produced under the high standards which govern every Fort Dodge biological.

Single-treatment package, two 25 Cc vials (Western or Eastern type)....$ 2.50
10-dose bulk container, 250 Cc vial (Western or Eastern type)..... 10.00

(Prices less 10% trade, 2% cash discount)

FORT DODGE LABORATORIES, INC.

FORT DODGE, IOWA

The May issue of *Successful Farming* contains an illustration of the statue, "The Veterinarian," by Sculptor Christian Peterson, which will stand in the veterinary college quadrangle at Ames. Says *Successful Farming*:

"'The Veterinarian' typifies the fine type of man who makes up our veterinary profession today. Like the country doctor, he is motivated by the spirit to serve humbly and to save life. Let us give our veterinarians the regard and consideration they so richly deserve."

Commissioner of Agriculture W. Kerr Scott stated to the veterinarians of North Carolina on the occasion of their annual meeting Jan. 26, that veterinarians are needed now as never before by the tar-heel state to safeguard its 100 million live stock industry. He stated that about half of North Carolina's counties are without veterinarians.

At the annual meeting of the Illinois Veterinary Medical Association in Springfield, February 17-18, 1938, the following officers were chosen for the ensuing year: C. E. Dille, Cairo, President; W. B. Holms, Springfield, Vice-president; C. Vanderwarf, Chicago Heights, member of the executive board and C. C. Hastings, Williamsville, (re-elected), secretary-treasurer.

AGENTS WANTED

Several desirable locations are available for enterprising agents to distribute Strasenburgh veterinary products.

Established in 1886, we have manufactured the finest quality veterinary pharmaceutical products for over half a century.

If you are interested in handling the Strasenburgh line, please write fully as to your qualifications and the territory you would be able to serve.

R. J. STRASENBURGH CO.
Rochester, N. Y.
Pharmaceutical Chemists Since 1886

Send for veterinary pharmaceutical catalog.

INCREASE YOUR INCOME

WITH *Vitality* Dog Food

Suggested by Veterinarian

"I have found VITALITY the most palatable of any of the foods I have tried on shy feeders. Our clients continue to buy it and report good results. Need I say more?"

Dr. H. Rudman, Union, N. J.

Many Veterinarians have found they can increase their incomes $100 or more a month by selling *Vitality Dog Foods.* The *Vitality* line of dog foods has proven itself to be palatable, highly nutritious, easily digested and a safe food for all types of dogs. *Vitality* supplies milk solids, minerals, vitamins and dextrinized cereals in desirable form. Our Special Offer for *Veterinarians* is meeting widespread approval. Write for complete details. No obligation.

VITALITY MILLS, INC.

Dept. VM-6, Board of Trade Bldg., Chicago, Ill.

We do not manufacture remedies and we always advise dog owners to see a reliable Veterinarian for medical service.

For Better . . . Faster . . .
Easier Dog Clipping

The NEW
STEWART
CLIPMASTER

New Easy-Grip handle only 2" in diameter

Veterinarians who have tested the new Clipmaster say it is the finest, fastest, easiest to use dog clipper of all time.

Clipmaster has powerful, air-cooled, ball bearing motor inside the special composition handle. Perfect balance for clipping in any position.

WHAT USERS SAY

"Got a compliment on every dog I clipped with Clipmaster."
"Paid for itself the first week I had it."
"Clipped 73 dogs without resharpening."
"Gave excellent service on 300 dogs last summer."

Clipmaster complete with 20 feet of cord, for use on any 110-volt A. C. or D. C., only $17.95. For other voltages $18.95. (Slightly higher West of Denver.) At your dealer's or send us $2.00. Pay balance on arrival. Write for catalog showing complete line of STEWART clipping and shearing machines. Made and guaranteed by Chicago Flexible Shaft Co., 5516 Roosevelt Road, Chicago, Illinois.

48 YEARS MAKING QUALITY PRODUCTS

Eastern Iowa Radio Program

The Eastern Iowa Veterinary Association went on the air this month, over Station WMT, Waterloo and Cedar Rapids, Ia., in a spring campaign to educate the farmers of eastern Iowa and western Illinois to a better and wider use of modern veterinary service.

The radio campaign, sponsored and paid for by the association, consists of daily, spot announcements during the noon hour, and will continue for three months. Timely subjects such as hog cholera, erysipelas, encephalomyelitis, rabies, scours, enteritis, and other livestock diseases are taken up in the broadcasts, and farmers are urged to consult their veterinarian promptly when any of the symptoms of such diseases occur.

The American Foundation for Animal Health, at the request of the Eastern Iowa Association, collaborated and assisted in preparing the copy for the broadcasts. The Foundation, set up by the Associated Serum Producers to carry on educational work in the interests of the veterinary profession has been doing some excellent work in this respect, in radio, newspaper, and farm paper campaigns in a number of states

---

Rayon that looks and feels like wool, and that possesses the same warmth-retaining quality, has been produced by chemists in the Eastman laboratories.

WAYNE DOG FOOD

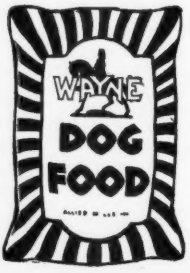
"The World's Finest Dog Food"

— Scientifically Compounded
— Biologically Tested
— A Quality Product

You can safely recommend Wayne Dog Food to your clients with assurance that it is a clean, wholesome food. It is nutritionally complete and keeps dogs in excellent condition. Try it in your own kennel—see how easy it is to feed—how good it is for dogs.

Write for sample and full details

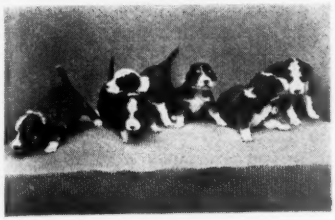
KENNEL FOOD DIVISION—ALLIED MILLS, INC.
FORT WAYNE, INDIANA



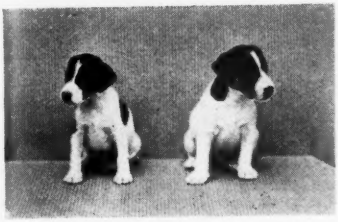
INTRODUCING

A New Scientific Method
Of Feeding Young Puppies

GAINES FORMULA 107-A



Fox Terrier Puppies—Raised Exclusively on Gaines Formula. Age 36 days.



Collie Puppies—Raised Exclusively on Gaines Formula. Age 40 days.

Cocker Puppy—Raised Exclusively on Gaines Formula. Age 30 days.

Send For Free Sample and Full Details

A Proven Diet For Orphans From Birth
A Weaning Formula for Puppies
A Supplementary Food for Adult Dogs
A Special Aid for Lactation

Formula 107-A is a brand new product developed in one of America's great nutritional laboratories designed to make the feeding of puppies from the day of their birth as nearly comparable to natural feeding as possible. Being always at a uniform standard, it often will raise a greater percentage of a litter of puppies than could the mother, herself.

Formula 107-A is also valuable as a supplementary feeding for young and old dogs. It is a special aid prior to whelping—improves lactation.

Formula 107-A is scientifically proportioned in its proteins, carbohydrates, sugars and fats to which have been added concentrates of water soluble vitamins of rice and milk—vitamins B_1 and B_2 (G), and of vitamins A and D of cod liver oil and iron salts. Homogenized, evaporated and sterilized.

Formula 107-A is a highly protective food nutritionally because of added vitamin values and the addition of definite amounts of iron salts. Homogenizing, evaporating and sterilizing provides safety and improved digestibility.

Gaines Formula 107-A is not expensive. It has been figured that it costs only about 3¢ per day to feed an average puppy on this ration.

An Opportunity for You

Gaines Formula 107-A means real opportunity for veterinarians who are interested in small animal practice. You buy at wholesale—and our entire advertising efforts will be bent to sending prospects to the profession. Good business makes it desirable for you to get full details at once. A post card will do—but be sure to mention that you are a veterinarian.

GAINES FOOD CO.

Box H-6 SHERBURNE, N. Y.

Scene at feeding time in one of the 37 pens at the TI-O-GA Experimental Kennels.

RELATION of CANINE DIET to DISEASE

As an experienced veterinarian, the close relationship between malnutrition and certain diseases is well-known to you.

For over 7 years we have carried on biological experimentation at the extensive TI-O-GA Experimental Kennels in an effort to identify those ingredients which were absolutely essential to dogs.

As a result of these experiments an extra supply of many ingredients—especially certain minerals—has been included in the TI-O-GA Dog Food formula.

There can be little doubt that resultant high resistance manifested to noninfectious disease is one of the major causes why six consecutive generations of bloodhounds have been raised and sustained in complete health on an exclusive diet of TI-O-GA Dog Food.

You may be sure that TI-O-GA Dog and Puppy Foods are worthy of your highest professional endorsement. If interested in dispensing TI-O-GA write to Dept. M-72.

BALORATIONS, Inc.
Division of TIOGA MILLS, INC.
Waverly, N. Y.

TI·O·GA *complete* **DOG** *and* **PUPPY FOODS**

Tests Indicate Reduction in Bang's Disease

In the 45 months since the coöperative work to control Bang's disease was begun, State and Federal veterinarians have tested an average of more than half a million cattle each month. Since July 1, 1934, a total of 23,715,375 blood tests have been completed. Of this number 1,471,990, or 6%, have been positive indicating the presence at the time of the test or in the past of the disease. The work is being conducted in the 48 States and in Puerto Rico.

During March 1938 there were 720,210 cattle tested with 27,824 reactors, or about 4% including retests. During the first four months of the present Bang's disease campaign the percentage was 14, which was due to the testing of many badly infected herds. In some herds the infection exceeded 20%. The smaller percentages this year, which include retests of infected herds, indicate that the disease is being reduced as a result of the cooperative work.

In five states the number of tests exceed a million—Wisconsin, 2,955,870 (190,389 positive); Minnesota, 1,743,443 (123,099 positive); Oklahoma, 1,478,118 (100,580 positive); Missouri, 1,186,191 (78,493 positive); Virginia, 1,169,591 (32,491 positive).

Periostine

Horse Back To Work in Three To Five Days

It is a powerful antidote to inflammation occurring in the periosteum, articulations, bursæ, tendons, ligaments; also where there is pain, exostosis or lameness. Usually only one application is necessary. One bottle is sufficient to treat three or more cases.

Endorsed by almost every veterinarian that has given it a trial.

FREE Booklet—"Reminders in Diagnosing Obscure Lameness."

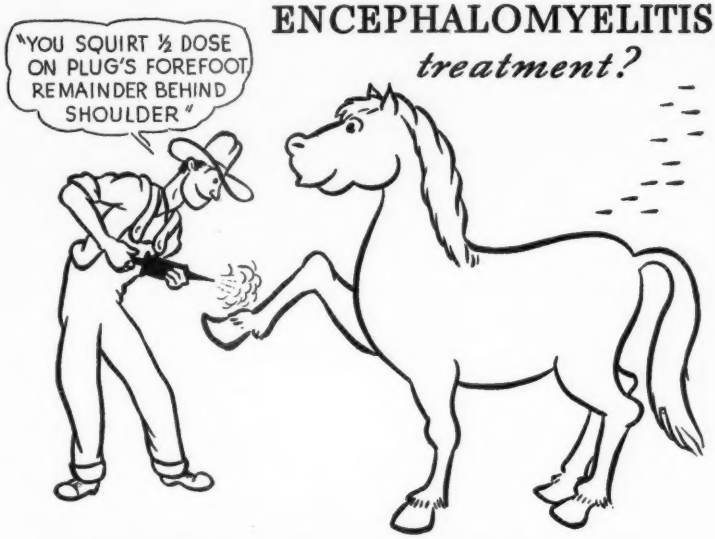
Price per bottle..$2.00
Three bottles 5.00

Free Sample. **To Every Veterinarian that has not received a sample, we will gladly send postpaid a liberal sample upon request. No obligation.**

DETROIT VETERINARY SUPPLY CO.
Detroit, Michigan
Canadian Branch, Windsor, Ontario

ever think of this as a new

ENCEPHALOMYELITIS *treatment?*



N*onsense? Of course!* **The half dose squirted on the animal's hoof will naturally be without value—but the *remainder*, if it is Cutter's monovalent serum or vaccine, will be *just as potent as a full dose* of polyvalent serum or vaccine.**

Remember—there is absolutely no cross-protection between Eastern and Western encephalomyelitis. For this reason a polyvalent vaccine or serum, at best, can be only *partially* as effective as monovalent serum or vaccine.

As the two diseases have remained geographically separated, there is no more logic in polyvalent products than there is in the suggestion to shoot half the dose on the animal's hoof.

For 100% efficiency . . . specify Cutter's Eastern or Western types —according to whether your practice is east or west of the Appalachian mountains.

CUTTER LABORATORIES
Berkeley, California

Equine Encephalomyelitis Products (Cutter)
Monovalent serum
NRW-250 cc Western Type Serum $6.00
NRE-250 cc Eastern Type Serum . 6.00
Vaccine
NQW-1 immunization (2 25-cc doses) Western Type . . 2.50
NQE-1 immunization (2 25-cc doses) Eastern Type . . 2.50
New package: NSW—5 immunizations (250-cc) Western Type 10.00
10% Trade Discount

Dr. Naylor's Medicated Teat Dilators

A safe and dependable treatment for Spider Teats, Scab Teats, Cut and Bruised Teats, Obstructions and for keeping teat canal open after operating.
Dr. Naylor Dilators fit either large or small teats without overstretching or tearing, are easy to insert and stay IN the teat. They carry antiseptics and healing agents into teat canal to combat infection and promote healing. The dilators themselves are Sterilized, Soft, Absorbent dressings which protect the inflamed area, absorb inflammatory exudates and keep teat canal open in its natural shape while tissues heal.

Price to Veterinarians

Dollar Package (contains 48 Dilators).....$8.00 Per Doz.
Fifty Cent Package (contains 18 Dilators)..... 4.00 Per Doz.
Plain Dispensing Package (contains 15 Dilators)..... 3.00 Per Doz.

H. W. NAYLOR CO. MORRIS, N. Y.

Fake Horse Remedies

There is only one kind of "medicine" that is safe and worthwhile to use in the prevention of equine encephalomyelitis, or sleeping sickness of horses. That one kind is vaccine administered by a licensed veterinarian. So says Dr. C. P. Fitch, chief in veterinary medicine at University Farm, who urges that farmers "show the gate" to peddlers who come around selling "sure cures."

Doctor Fitch emphasizes that farmers should place their faith entirely in reputable licensed veterinarians, insofar as "doctoring" of horses for sleeping sickness is concerned. A few licensed manufacturers are selling vaccines to be administered by farmers to their own horses, but Doctor Fitch says it is risky for a farmer to try to give the vaccine. Abcesses may form at the point of injection and animals treated by inexperienced operators may develop nervous disorders and other serious results.

Remedies and treatments other than vaccines and serums are nothing but out-and-out fakes, Doctor Fitch warns, and will be worthless if they are not positively harmful.—*Biwabik* (Minn.) *Times.*

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For 24-hour service on Fowler Brand Serum, Pharmaceuticals, and Biologics, communicate with the nearest Armour Branch House or Creamery, or with one of these distributors: Dr. Robert D. Wall, 910 28th St., Des Moines; L. L. John, 1018 S. Lyndhurst Drive, Indianapolis.

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MONTREAL

The annual dinner dance of the Kansas State College Junior Chapter of the A. V. M. A. was held April 22. Over 400 students, faculty members, and guests were present.

The seventh annual short course of the Louisiana Veterinary Medical Association was conducted at the Louisiana State University, Baton Rouge, March 2-3, 1938. A splendid program was presented and the short course was well attended, 75 attending the banquet. Officers of the association elected for the ensuing year, are: C. E. Page, president; W. A. McDonald, vice-president, and C. H. Heflin, secretary-treasurer. All the officers reside in Baton Rouge.

Six cats and nine dogs were suffocated in a $24,000 fire which destroyed the Webber Brothers Small Animal Hospital, Rochester, N. Y., on April 21. Nine dogs were saved. Spontaneous combustion was given as the cause of the fire.

This was the second animal hospital fire in this locality within the month, Dr. L. A. Norget of Henrietta, N. Y., having lost several dogs when his hospital burned a few weeks previously.

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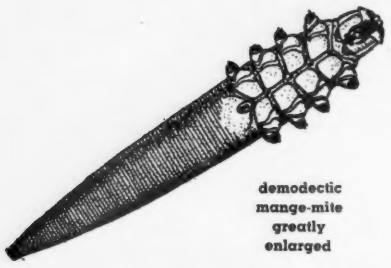

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Thoroughly tested before offered to the profession. Found specific as well as easier and safer to use. Hospitalization of patients, while always preferable, is not necessary except in generalized cases.

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A "Live" Association

"Public Health in the World of Tomorrow" is the central theme of the 67th Annual Meeting of the American Public Health Association to be held in Kansas City, Mo., October 25-28.

Recognizing that the responsibilities of the health official have expanded by sheer force of necessity into fields of diagnosis and treatment, considered in the very recent past as beyond the circle of health department obligations, the program of the Association's 67th convention will attempt to look around the corner and see what's ahead for the career man or woman in the public health profession.

It is agreed in Association councils that the advance in public health has been so rapid in the last half dozen years that a clarification of current objectives and policies is urgently needed. The convention will sound that note at the beginning of its deliberations, getting under way with a ses-

THE VETERINARY RECORD

Founded 1888

A weekly journal for the Profession.

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A—Before Treatment A—After Treatment B—Control

Abbott announces NICAMIN

for the treatment of blacktongue in dogs

● After thorough investigation and trial, Abbott offers Nicamin, a sterile solution of nicotinic acid which is a member of the vitamin B complex and a specific in the treatment of canine blacktongue. It may be injected intramuscularly, subcutaneously, or intravenously. ● Administered in the ratio of 5 to 10 milligrams per kilogram of body weight, Nicamin secures a rapid and lasting improvement. Within 48 hours, the mucous membranes have a definitely less reddened appearance, and the appetite is materially improved. All symptoms usually disappear at the end of 5 or 6 days and there is a constant gain in weight. ● In the first photograph above, dog "A" is shown after remaining on a blacktongue-producing diet for 49 days. Weight, 7 pounds. In the next picture, he is shown 20 days later, having received 3 intramuscular injections of Nicamin of 10 mg. each in the interim. Weight, 10½ pounds, a gain of 3½ pounds in 20 days. Control dog "B", a litter mate of dog "A", is shown at end of 69 days, having remained on blacktongue-producing diet through entire test period. Weight, 6½ pounds. ● Each cc. of Nicamin contains the equivalent of 50 milligrams of nicotinic acid. Supplied in 20-cc. sterile containers at $1.30 each. Literature sent on request.

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The Missouri Valley Serum Company makes one of the clearest serums produced at this time.

We earnestly request that you COMPARE our serum with other brands for clearness, and we will abide by your decision. This also means that our serum is quickly absorbed and works freely in the syringe.

Send for our NEW 1938 Drug Catalogue. All of our branches and distributors carry Serum, Drugs and Biologics—send them your next order.

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50 NORTH SECOND STREET **KANSAS CITY, KANSAS**

Member Associated Serum Producers

sion devoted to a discussion of the present state of the health of the nation. Thereafter, the central theme, "Public Health in the World of Tomorrow" will be emphasized throughout the several days of meetings.

The American Public Health Association is a society of professional public health workers. Its membership numbers nearly 6000 and includes health officers, laboratory workers, vital statisticians, industrial hygienists, child hygienists, public health engineers, food and drug experts, health education authorities, nurses, epidemiologists and others who specialize in disease prevention and health promotion.

An attendance of 3000 is expected at the Kansas City Annual Meeting drawn from every state in the Union, from Canada, Cuba, Mexico and from abroad.

Thirty-three clinics were held in Caddo Parish, February 14th, under the direction of the Caddo Shreveport Health Unit for the purpose of vaccinating dogs against rabies. The work was done entirely by local veterinarians. The fee for a license was $1.50.

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To the thousands of veterinarians who have used Fistone, and to those who have not yet had the opportunity—we urge you not to overlook the fact that Fistone is unsurpassed and unequalled as a conditioning powder, as it is unsurpassed in its performance in the care of Fistulous cases and most animal diseases of obscure or unknown origin. Order now!

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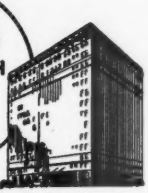
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LINDELL BOULEVARD AT GRAND

The Fayette County (Iowa) Veterinary Association held its monthly-dinner-meeting at Oelwein, Iowa, Feb. 15.

Fayette, Buchanan, Bremer, Clayton, Cerro, Gordo, Polk, and Linn counties were represented by veterinarians in attendance.

The speakers were: State Veterinarian H. A. Seidell, Des Moines; Deputy State Veterinarian E. G. Dunn, Mason City; Deputy State Veterinarian Paul A. Weires, Oelwein, and R. M. Hofferd, Cedar Rapids, U. S. Veterinary Inspector on Hog Cholera Control.

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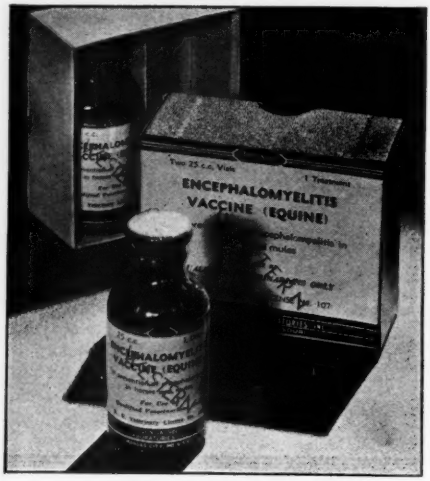
Laboratory test and field experience have indicated the efficiency of this valuable product.



Administer 2-25 c.c. dose treatment to each animal. Vaccinate early—May-June.

The production of Equine Encephalomyelitis Vaccine is zealously guarded to assure an efficient product, to protect horses in your territory against this infection.

for Prophylaxis—

One treatment (individual box) 2-25 c.c. vials.....$ 2.50
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KANSAS CITY, MISSOURI

Dr. H. B. Raffensperger Dies

Dr. Hays B. Raffensperger, 61, associate veterinarian, Bureau of Animal Industry, died at his home in Moultrie, Ga., May 22, after a brief illness. He is well known in veterinary circles as co-sponsor of the swine sanitation system which Dr. B. H. Ransom first put into operation in McLean County, Illinois, Doctor Raffensperger doing the field work. He also aided in developing and demonstrating a similar plan for controlling swine kidney worms as well as roundworms.

Doctor Raffensperger obtained his academic education in the Cumberland Valley State Normal School from which he received a degree of Pd.M. Before studying veterinary medicine he was principal of the New Bloomfield, Pa., schools. He attended the Chicago Veterinary College and was graduated with a degree of M.D.C. in 1909. He had previously served the Bureau for three years in the meat-inspection service at Chicago. His first assignment to parasite-control work was in connection with trichina investigations in Chicago in 1915. He was assigned in 1925 to swine-parasite work in Illinois and in 1928 he was transferred to Miles City, Mont., in charge of investigations on horse parasites. In 1930 he was placed in charge of the investigations of internal parasites of swine at Moultrie, Ga.

Doctor Raffensperger is author of several Department of Agriculture publications concerning parasitism in swine and other livestock. He is survived by his widow, three daughters, three grandchildren, a brother and two sisters. He was a veteran of the Spanish-American War and a Major in the Veterinary Reserve.

At the graduating exercises of the Ontario Veterinary College, Guelph, Ont., May 13, 1938, the gold medal awarded by the college for the highest aggregate standing during the four-year course went to L. W. Groves, North Platte, Nebr. Second prize was awarded to W. E. LaGrange, and third to J. M. Isa. Other senior awards were: Andrew Smith Memorial Medal, W. E. LaGrange; Helen Duncan McGilvray Prize, C. A. Niles; Special Prize in Bacteriology, R. T. Ingle; Canadian Army Veterinary Corps Prize, K. E. Brown.

Third-year awards were made as follows: General Proficiency: first, E. L. Symington; second, E. W. C. Manning; third, J. H. Leslie. Pathology: W. P. O'Connor. Parasitology: Miss Jean Rumney and T. Kragness. Canine Diseases: N. E. Anderson. Canadian Army Veterinary Corps Prize: E. F. Pallister.

Second-year awards: General Proficiency: first, W. J. Stinson; second, J. J. Fanning; third, W. A. Taylor. Anatomy: W. W. Sherwin. Histology: H. E. Knapp. Canadian Army Veterinary Corps Prize: D. Garrick.

First-year awards: General Proficiency: first, J. L. S. Anderson; second, D. A. Barnum; third, C. H. Bigland. Anatomy: H. T. Anderson. Histology: W. L. Parkhill. Canadian Army Veterinary Corps Prize: I. J. Woolsey.

Eichhorn Returns to the B. A. I.

The vacancy caused by the death of the late Dr. John M. Buck, Superintendent of the Animal Disease Station of the Bureau of Animal Industry, at Beltsville, Maryland, has been filled by the appointment of Dr. Adolph Eichhorn, Director of the Veterinary Department of the Lederle Laboratories.

At the Honor Day exercises May 16, 1938, at New York State Veterinary College, Cornell University, Ithaca, N. Y., the following prizes were awarded: The Addison D. Merry Prize: first prize ($30) Ralph E. Loomis, '40; second prize ($20) Theodore Allen, '40; honorable mention, Ralph L. Gangarosa, '40, Rebecca Gifford, '40, Norman E. Skinner, '40. The Jane Miller Prize: first prize ($25) Edwin J. Sunderville, '39; second price ($15) Wilson B. Bell, '39; honorable mention, Raymond Fagan, '39, Robert Ferber, '39, Isidore I. Sprecher, '39. The Charles Gross Bondy Prize: first prize ($25) Walter R. Dennis, '38, second prize ($15) Milton H. Covert, '38; honorable mention, Alexander Morris, '38, Robert B. Morris, '38. The Anne Besse Prize ($40): George W. Snook, '38. The James Gordon Bennett Prize ($40): John W. Earl, '38; honorable mention, James E. Helyar, '38. The Horace K. White Prize: first prize ($75) Alexander Morris, '38; second prize ($25) Stephen J. Roberts, '38; honorable mention, Robert B. Morris, John W. Earl, Benedict V. Favata.

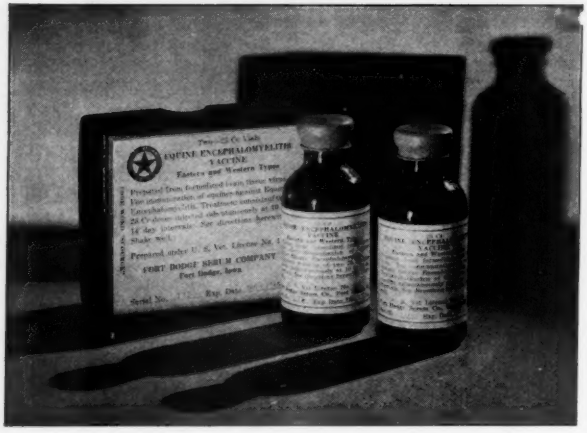
The announcement of the prize winners in the Division of Veterinary Medicine of Kansas State College, Manhattan, Kans., was made at the annual dinner-dance of the college's junior chapter of the A. V. M. A. April 22. The Alumni First Prize in General Proficiency went to Joseph R. Sterling, and the second prize to David Jacobson. Other senior prizes were: The Bower Prizes in Small Animal Clinics: first, Charles B. Randall; second, Joseph G. Feinberg; The Franklin Prizes in Pathology: first, Herold G. Wixom; second, Jacob Antelyes.

The Salsbery Prizes in Therapeutics were awarded to first, Wade Oberlin, '39; second, Guy A. Railsback, '39. The Harwood Prizes in Physiology were awarded to Orin E. Ellis, '40, and Roger Guy Spencer, '40, who divided first honors.

At the commencement exercises May 30 high honors were awarded to Charles B. Randall, and honors to Herold G. Wixom, Jacob Antelyes, and David Jacobson.

Over 99% Protective Efficiency

. . . indicated by results of two-dose vaccination of over 70,000 head last year . . . by two years' field observation of checked results in outbreak areas.



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Single-treatment package, two 25 Cc vials (Western or Eastern type).....$1.75
Five single-treatment packages 7.00
10-dose bulk container, 250 Cc vial (Western or Eastern type)..... 7.00

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Deaths of Veterinarians

Oscar B. Phillips, 64, Blytheville, Ark., Mar. 20 (from rabies, the result of a dog bite); Samuel D. Haynie, 47, Covington, Ga., Mar. 27; Charles J. Sinek, 28, Pocohontas, Ia., Apr. 17; William P. Bossenberger, 53, Webster City, Ia., Apr. 21; Phillip C. Ballou, 70, Piper City, Ill., Apr. 25; Charles G. Everton, Monroe Center, Ill., May 1; I. Houston Britt, 58, Batavia, Ia., May 4; Richard Kuoni, Prairie du Sac, Wisc., May 16, W. B. Hobson, 63, Asheville, N. C.

L. U. Shipley, 76, Sheldon, Ia., died Apr. 16, 1938. Doctor Shipley was one of the pioneer veterinarians of Iowa and known throughout the state. Since 1922 he had beeen mayor or councilman-at-large of his home city.

Dr. Charles R. Corson, a recent graduate of Michigan State College, is taking over the practice of the late Dr. Payson Schwin in Elkhart, Indiana, where he plans to build a small animal hospital.

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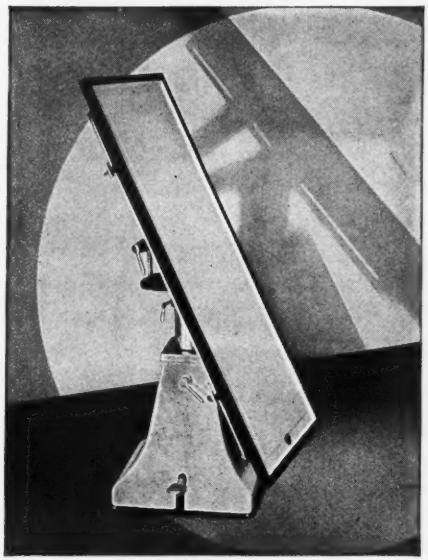

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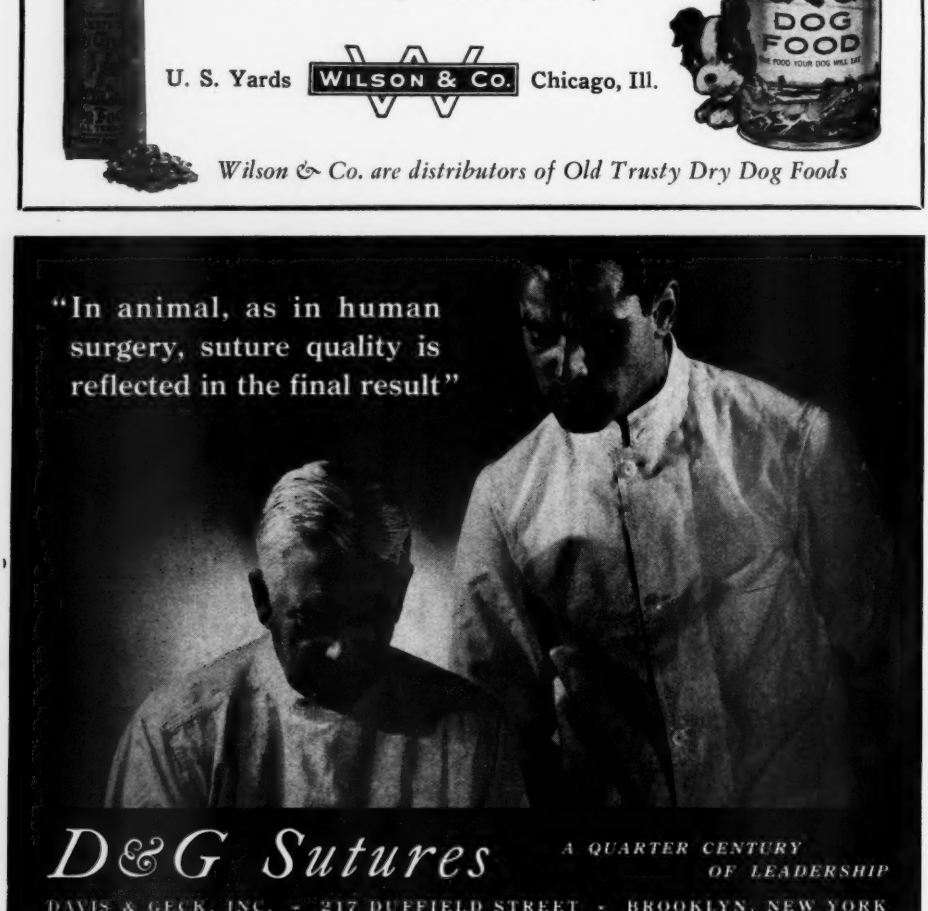
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Gaines Formula 107-A makes the feeding of orphan puppies as nearly comparable to natural feeding as possible. It is a simulated bitch's milk **at its best**; and thus nourishes puppies as does a mother when ideal conditions prevail. Naturally, such a product will be valuable not only for the orphan puppies but also during the critical time of weaning. It makes the transition from breast or bottle to solid food comparatively free from upsets and interruption of growth.

New Information On Puppy Feeding Sent You On Request—Soon Ready

The clinical work necessary to develop Gaines Formula 107-A disclosed various facts concerning puppy feeding that are widely at variance with generally accepted theories. For example, it was definitely found that young puppies should not be fed oftener than at eight-hour intervals . . . that control of diarrhea lies in frequency of feeding . . . and so on. As soon as possible, this data will be printed and copies will be available for you. Then it will be our policy to refer puppy raisers to the nearest veterinarian for the latest information and the best ways to use Formula 107-A in their kennels. You are invited to join this movement to cut down puppy mortality. Send for your sample of the Formula, today. Full information will be sent you—without obligation.

The first solid food recommended on the GAINES FEEDING PROGRAM is Gaines Meat & Milk Meal. Would you like a sample of this, also?

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and Price List; describing in detail almost 200 Veterinary Specialties; in many cases with indications and recommended dosages; quoting regular veterinary hospital discount prices.
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Veterinary and Animal Feeding Products Division

An interesting report on the first two years' work of the American Foundation for Animal Health is being distributed to members of the veterinary profession this month by the Associated Serum Producers.

The report covers the chief features of the educational campaign to livestock owners now being carried on by the Foundation in the interests of the veterinarian. It details the radio programs, farm paper advertising, newspaper publicity, and other phases of the campaign which seeks to impress upon the farmer the importance of guarding the health of his livestock, and the advantage of using experienced veterinary service to avoid needless losses.

Founded two years ago by members of the Associated Serum Producers, the American Foundation for Animal Health has been doing splendid educational work in the interests of the veterinarian, and its activities are expected to have a far-reaching effect as the campaign continues.

The Northwestern Indiana Veterinary Association is holding a large animal clinic on Wednesday, June 22nd at Rensselaer, Ind.

Dr. Chas. W. Bower is quoted in the *Wichita* (Kans.) *Beacon* as stating that 1500 cats have died in Topeka within recent weeks from infectious enteritis.

The Florida Board of Veterinary Examiners will hold an examination June 27-28 at Jacksonville for license to practice in that state.—H. C. Nichols, *Sec.-Treas.,* Ocala, Fla.

The Cedar Valley (Iowa) Veterinary Association held its annual ladies' night dinner at Waterloo May 9, with sixty-three veterinarians and guests in attendance. The following new officers were elected: president, Dr. C. E. Juhl, Osage; vice-president, Dr. G. C. Brown, Hudson; secretary-treasurer, Dr. C. B. Strain, Dunkerton (re-elected).

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Chemical and biological control of each lot produced

Extensive clinical application

Thirteen years' acceptance by the Council of Pharmacy and Chemistry of the American Medical Association

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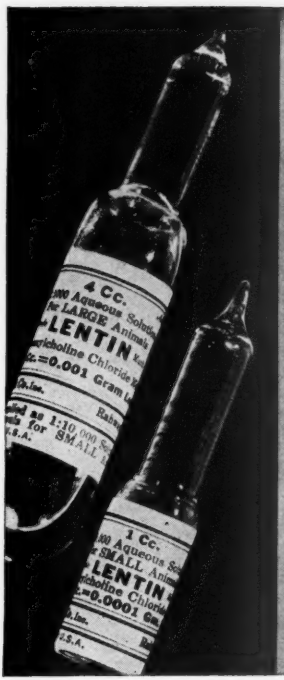

LENTIN

TRADE MARK
REG. U. S. PAT. OFF.

(Carbamylcholine Chloride Merck)

A New, Rapidly-Acting Parasympathetic Stimulant for the Treatment of

Constipation **Impaction**
Atony of Bowel **Gastro-intestinal Catarrh**
Tympanites **Dyspepsia**
Cecal and Colonic Impaction in Horses
Impaction and Atony of Rumen in Cattle and Sheep Choke (pharyngeal and esophageal obstruction)

LENTIN, by its rapid and powerful effect upon parasympathetic nerves, increases the tone of the bowel musculature, stimulates peristalsis and the secretion of normal saliva, gastric, and intestinal juices. Its effects are more rapid and pronounced than those of Arecoline, Eserine, or Pilocarpine.

Lentin is being distributed under license by the following companies:

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and subsidiary
PITMAN-MOORE COMPANY
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THE CORN STATES SERUM CO.
Omaha, Neb.

DETROIT VETERINARY SUPPLY CO.
Detroit, Mich.

FORT DODGE LABORATORIES, INC.
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HAVER-GLOVER LABORATORIES
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JENSEN-SALSBERY LABORATORIES INC
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NORDEN LABORATORIES
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R. J. STRASENBURGH CO.
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Lentin is marketed in two sizes: 6 x 1 cc. ampul LENTIN FOR SMALL ANIMALS (1:10,000 aqueous solution). 6 x 4 cc. ampul LENTIN FOR LARGE ANIMALS (1:1,000 aqueous solution).

MERCK & CO. Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

Periostine

Horse Back To Work in Three To Five Days

It is a powerful antidote to inflammation occurring in the periosteum, articulations, bursæ, tendons, ligaments; also where there is pain, exostosis or lameness. Usually only one application is necessary. One bottle is sufficient to treat three or more cases.

Endorsed by almost every veterinarian that has given it a trial.

FREE Booklet—"Reminders in Diagnosing Obscure Lameness."

Price per bottle..$2.00
Three bottles 5.00

Free Sample. To Every Veterinarian that has not received a sample, we will gladly send postpaid a liberal sample upon request. No obligation.

DETROIT VETERINARY SUPPLY CO.
Detroit, Michigan
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U. S. CIVIL SERVICE EXAMINATIONS

Civil service examinations will be held for five positions open to veterinarians and others in the Bureau of Animal Industry, U. S. Department of Agriculture. Applications must be on file with the U. S. Civil Service Commission, Washington, D. C., by June 20 (June 23 from states west of the Rocky Mountains), 1938. Appointments will be to the Bureau's new Poultry Regional Research Laboratory at East Lansing, Mich. The positions are:

1. Principal Poultry Husbandman, salary $5,600
2. Senior Veterinarian (Poultry Pathology), salary $4,600
3. Veterinarian (Poultry Pathology), salary $3,800
4. Associate Veterinarian (Poultry Pathology), salary $3,200
5. Assistant Veterinarian (Poultry Pathology), salary $2,600

Applicants will not be assembled for the examination, but will be rated upon education and experience. For the first position education must include graduation in agriculture or veterinary medicine; for the others, college graduation with veterinary medicine the major subject of the course. Experience required is 7 or more years of poultry research for the first position; 6 years for the second; 5 years for the third; 3 years for the fourth; and 2 years for the fifth position. Appropriate postgraduate study may be substituted for

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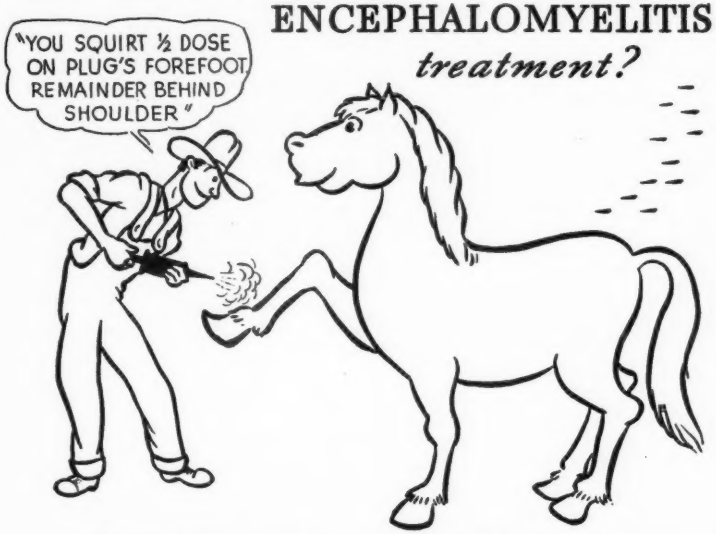

Nonsense? Of course! The half dose squirted on the animal's hoof will naturally be without value—but the *remainder*, if it is Cutter's monovalent serum or vaccine, will be *just as potent as a full dose* of polyvalent serum or vaccine.

Remember—there is absolutely no cross-protection between Eastern and Western encephalomyelitis. For this reason a polyvalent vaccine or serum, at best, can be only *partially* as effective as monovalent serum or vaccine.

As the two diseases have remained geographically separated, there is no more logic in polyvalent products than there is in the suggestion to shoot half the dose on the animal's hoof.

For 100% efficiency . . . specify Cutter's Eastern or Western types —according to whether your practice is east or west of the Appalachian mountains.

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Berkeley, California

Equine Encephalomyelitis Products (Cutter)

Monovalent serum

NRW-250 cc Western Type Serum $4.50
NRE-250 cc Eastern Type Serum . 4.50

Vaccine

NOW-1 immunization (2 25-cc doses) Western Type . . 1.75
NOE-1 immunization (2 25-cc doses) Eastern Type . 1.75
5 treatment package (250-cc) Eastern or Western Type 7.00

10% Trade Discount

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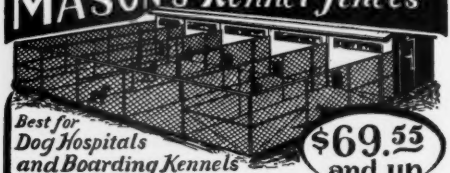

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experience up to a maximum of 3 years. The age limit is 53 years.

Application blanks may be had at any First Class postoffice, or from the U. S. Civil Service Commission.

Commencement exercises at Colorado State College, Fort Collins, Colo., were held May 31st. Sixteen men were graduated from the division of Veterinary Medicine. John Williams held the scholarship record for the division, and he and William D. Pounden were elected to the honorary society of Phi Kappa Phi.

HARLTON'S LIQUID BLISTER *and* FREE BOOKLET

Easy to apply. Saturate on with hand—no rubbing. Doesn't burn, set skin "on fire," kill hair, or scar. Head let down in few hours. No rest necessary in many cases. Vary application to produce just degree of counter-irritation needed. Diluted with oil, makes any strength liniment desired. FREE SAMPLE—a $1.00 bottle sent free postpaid upon request if you have never had one . . . . treats several cases. It doesn't pay to be without this convenient, effective and economical preparation; write for sample or mail order today. 4-oz. size, $1.00; 16-oz., $3.00.

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WEEN
This paragraph is reproduced from the first of a series of articles appearing in the June issue of Veterinary Medicine, entitled: "Canine Pediatrics".
pretation of the scientific record upon
hich this discussion is based.
RESEARCH and clinical work in the well-established field of nutritional science now makes available to the veterinary profession a milk formula simulating the nutritional characteristics of bitch's
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milk.
Ween is a product developed after nearly five years of biochemical research employing more than 500 puppies and dogs.

Thousands of Veterinarians and Breeders Have *proved* the Value of WEEN!

● Scarcely a year ago, Ween emerged from nearly 5 years of scientific research to earn a prominent position in the field of canine nutrition. Today the value of Ween has been *proved* by the nutritional results obtained especially in feeding Ween to puppies, and also to dogs of all ages and breeds. Ween has helped overcome many dog feeding problems, some of which had *never* been solved before.

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For feeding orphan puppies.

Before, during and after weaning.

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When bitch's milk is "acid," or insufficient, or for digestive upsets.

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To fortify bitches before and after whelping.

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For stud dogs.

For keeping show dogs in condition on circuit.

For sick, convalescent and off-feed puppies and dogs of all ages and breeds.

Ween is especially rich in milk-protein, fats and carbohydrates and contains *extra* amounts of all the vitamins needed for normal growth, strong bones, sound teeth and a smooth, heavy coat. Ween is made by an organization producing one of the finest infant foods available today.

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FOR PRICES IN CANADA WRITE TO
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MONTREAL

Army Veterinary Service

Lt. Col. Raymond A. Kelser is directed to proceed to Lexington, Ky., on or about June 20, 1938, on temporary duty for seven days to attend conference, then to return to Washington, D. C.

Transfers.—Capt. Russell McNellis, from Washington, D. C., to West Point, N. Y., for temporary duty June 15 to July 15; Col. Robert J. Foster, from Fort McDowell, Calif., to Moffett Field, Calif.; Lt. Col. John H. Kintner, to Fort McDowell, Calif., in addition to his other duties at Fort Mason, Calif.

Promotions.—Walter Smit to captain, May 1, 1938, and Donald C. Kelley to captain, June 1, 1938.

Veterinary Reserve Corps

Promotions.—Elmer Lash to lieutenant colonel; Rudolph Oscar Omdalen to captain; Wm. Hugh Pavey to 1st lieutenant.

New Assignments to Active Duty with CCC.—1st Lts. Elmer F. Fink, Ray Seaborn, and Duane LeRoy Cady.

Termination of Assignment to Active Duty with CCC.—1st Lts. William J. Seagers, Nathaniel Werrin, Leonard Wilbur Hibbs, James J. Miller; Capts. Fay E. Broad and Leo A. Hock.

An aid to keeping a race-horse in condition after each race or work-out, is to apply Antiphlogistine all around the fetlock and well up and around the shank. Some trainers do this regularly with the most gratifying results.

If there has been any straining of the tissues, Antiphlogistine lends support and promotes decongestion and repair, while its antiseptic properties and other medication help to prevent any infection, inherent in an abrasion or contusion, from becoming a major one.

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Diamine is a ten-year-old medicinal dye introduced as an internal microbicide against considerable skepticism before the curative action of other dyes had won the consensus of medical opinion.

100 c.c.....$0.50
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Diamine kills streptococci **in vitro** at 1 : 100,000 and inhibits the growth of important bacterial pathogens at 1 : 1,000,000. It is not irritant nor toxic.

From these facts one may leave its many indications to the judgment of the professional user, in the various branches of clinical veterinary medicine.

A treatment of choice in placental and uterine infections, acute mastitis, metro-peritonitis, the grave wound diseases (septicemias), and infectious enteritis.

Used subcutaneously, intravenously, intramuscularly or internally, per os.

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PROTECTION

The Veterinarian is in a position of great responsibility, for it is his duty to protect the livestock industry against disease. In order to successfuly accomplish these results, it is necessary to use the best Drugs and Biologics obtainable.
Missouri Valley products meet all of these requirements. If you are not already using our products—give us your next order.
Send for our NEW 1938 Drug Catalogue. We have a branch or distributor near you for prompt service.

MISSOURI VALLEY SERUM CO.

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Member Associated Serum Producers

North Western Illinois Veterinarians Meet

A meeting of the North Western Illinois Veterinary Medical Association is scheduled for June 22, 1938, at 1:00 p. m., at the Hotel Faust, Rockford, Illinois. The subject for discussion is WHY, HOW, and WHEN to correct the ills of the veterinary profession in Illinois. According to Roy E. Kluck, the secretary-treasurer, a very definite answer to these questions will be suggested, and an invitation to be present is extended to every licensed graduate veterinarian in the state who is interested in the future of the veterinary profession in Illinois.

Dr. Fred Edwards, Buncombe, Ill., was killed in an automobile crash Apr. 17. With Doctor Edwards at the time of the crash and also killed was Oscar Fleming, son of the late Dr. O. N. Fleming, who lost his life in an automobile accident some years ago.

Humane societies in the United States collect and dispose of more than a million cats a year. Public authorities do not collect these animals or pay societies the cost of the service. The work is done and paid for by private philanthropy through the societies. If this were not done the number of cats would increase by millions.

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To the thousands of veterinarians who have used Fistone, and to those who have not yet had the opportunity—we urge you not to overlook the fact that Fistone is unsurpassed and unequalled as a conditioning powder, as it is unsurpassed in its performance in the care of Fistulous cases and most animal diseases of obscure or unknown origin. Order now!

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Army Veterinary Service

Transfers.—1st Lt. Wayne D. Shipley, from Fort Reno, Okla., to Army Veterinary School, Washington, D. C., Sept. 15; Maj. Raymond T. Seymour, from Madison Barracks, N. Y., to Fort Reno, Okla., Sept. 10; Lt. Col. Daniel S. Robertson, from Philippine Department to Fort Bragg, N. C.; Lt. Col. Clifford C. Whitney, from Panama Canal Department to Fort Brown, Tex.; Lt. Col. Josiah W. Worthington, from Fort Brown, Tex., to Fort George G. Meade, Md.; Capt. Bernard F. Trum, from Fort Oglethorpe, Ga., to University of Kentucky, Lexington, Ky.; Lt. Col. Charles S. Williams, from Fort Knox, Ky., to Fort Sam Houston, Tex., Sept. 15; Lt. Col. Stanley C. Smock, from Fort Lewis. Wash., to Madison Barracks, N. Y.; 1st Lt. Benj. F. Leach, from Fort Sheridan, Ill., to Fort Knox, Ky. (temporary); 1st Lt. Lloyd C. Tekse, from Presidio of San Francisco, Calif., to USAT Meigs (temporary); Lt. Col. Fred W. Shinn, from Fort Francis E. Warren, Wyo., to Fort Douglas, Utah (temporary); 1st Lt. Walter T. Carll, V.C., from Fort Hoyle, Md., to Army Veterinary School, Washington, D. C.; Lt. Col. Jean R. Underwood, V.C., from Army Medical Center, Washington, D. C., to Philippine Department.

New Acceptance.—1st Lt. Stephen Grieve Asbill, Veterinary Corps Reserve, as first lieutenant in the Veterinary Corps, Regular Army, with rank from Sept. 8, 1938.

Assignments.—1st Lt. Stephen Grieve Asbill, to Presidio of Monterey, Calif.; Lt. Col. Herbert K. Moore, as attending veterinarian at Fort Lawton, Wash., and Fort Worden, Wash., in addition to his other duties; Lt. Col. Wm. R. Wolfe, as attending veterinarian at Lowry Field, Denver, Colo., in addition to his other duties.

Promotions.—To lieutenant colonel: Raymond T. Seymour, June 17; Oscar C. Schwalm, June 18; Claude F. Cox, June 28; Harry L. Watson, July 18; Gardiner B. Jones, Aug. 11. To major: Stanley M. Nevin, Aug. 4. To captain: Bernard F. Trum, June 25; Thomas C. Jones, July 24; Edwin L. Millenbruck, July 26; Lloyd C. Tekse, Sept. 30.

Retired.—Lt. Col. Howard M. Savage, V.C., Sept. 30.

Veterinary Corps Reserve

Promotions.—To major: John Warden Burke. To captain: Arthur Frederick Van Meveren, Elmer Fred Finke, Henry Vance Lewis, Alvin Rutti McDonald, Arthur Bartlett Rogers, Herbert Franklin Sibert. To 1st lieutenant: J. Vernon Shannon.

New Acceptances.—1st Lts. Dan James Anderson, Clement Ignatius Angstrom, Myron Saul Arlein, Willis Wm. Armistead, Jamie Wilson Barton, Edwin A. Beckcom, Jr., Gerald Christian Bek, Wm. Thomas Bell, Grafton Diddle Bowers, George Riley Burch, Jr., Hugh Burkett Campbell, Francis Adam Caspar, Charles Smith Cassias, Donald Louis Cassidy, Charles Wm. Chadwick, Vernon Davis Chadwick, Merwyn Pierce Chapman, Robert Frederick Chrisman, George Edward Cottral, Nelson David Crandall, James Marion Cullison, Charles Henry Cunningham, Frank James Davies, Marvin Suloff Ebright, Joseph Abraham Farney, Merle LeRoy Farris, Carl Fink, Lon E. Foote, Charles Benj. Frank, Robert Dean Franks, Philip LeClero Gauntt, Jr., Merwin Jack Gregg, Jack H. M. Gregory, Chester Earle Guthrie, Samuel Leighton Haines, John Steward Haley, Raymond Theodore Hander, Hyman Joseph Harkavy, George Gabriel Hartle, Robert Henry Hartman, Fredrick Barthell Haynie, James Walter Heaton, Jr., Doyle Winston Hennessee, Leland Stanford Hughes, Ivan Monell Jackson, David Jacobson, Jack Arden King, Kenneth Whittier Klaus, Jack Oliver Knowles, Carl Henry Koll, Wm. Earl Kraus, Maurice Clayton Larson, Raymond Edward Larson, Arthur Lancaster Leibert, Sidney Mercer Levine, Abe Levy, Ernest Leland Love, Jon Alan McCurdy, Arlye Milo McDermid, Ian Currie McDonald, Thomas Mathew McIntyre, Raymond Leroy McMahan, George Badsky Maichel, Henry Keller Maier, Warren Rusch Marks, Ross Taylor Mickle, Robert Jay Miller, John Alden Morton, Andrew A. Moore, Wilbur Henry Mowder, Roy Albert Nipko, Wm. Andrew Nusser, Victor Thomas Oliver, Lowell Abbott Osborn, Elton Vernon Parsons, Hyman Henry Pogorelsky, Wm. Dawson Pounden, Harold Propp, Charles Bernard Randall, John Allen Randle, Melville Collins Rawnsley, Earl Conrad Ritter, Robert Francis Rochfort, Maurice Anthony Schooley, A. V. Schwartz, Jr., Rogert Clark Scott, Clarence Franklin Shelby, Robert Walter Short, Warren Lang Skinner, Edwin James Smith, Wm. Daniel Smith, Darrell Bernard Sprott, Joseph Robert Sterling, Sidney Wilson Stiles, Charles Wm. Tate, John Wilkey Taylor, Burton Campbell Thomson, Vale Ulan Thomson, Edward Herman Von Glan, Raymond Woodrow Wann, Benj. Franklin Ward, Jr., John Clark Williams, Keith Bud Wiser, Herald George Wixom, Armour Curie Wood, Walter A. Anderson, Ralph Owen Anslow, Raymond Adam Bankowski, Clarence Carl Bach, Russell Albert Barber, Earl Baumwell, Ralph Joseph Becher, Charles Richard Border, Walter B. Bradley, Earl Frederick Brown, Howard Francis Carroll, Jr., Frank A. Carter, Wilber Geo. Collins, Harold Keim Cooper, Milton Howell Covert, Wilfred Markus Crow, Louis Theron Dawe, James Hervey De Groodt, Walter Roland Dennis, Thomas McCaully Eagle, Burman John Elander, Robert Geo. Elmore, Dell Clarence Finch, Milton Warren Firestone, George James Fohey, Donald James Francisco, Wm. James Friderici, Wm. Edward Glindmyer, Geo. Wm. Green, Jr., Robert Lyle Griffith, Jr., Henry Earle Grossman, Roger Grossman, Orville John Halverson, James Edwin Helyar, Wilbur Carlton Hirschey, Wm. Russell Hulbush, Ross Harrison Hurt, Robert Francis Jewett, Robert Loomis Jimison, Klemens Frank Johnson,

(Continued on page XVI)

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An important Fort Dodge contribution to small animal practice

★ Extensive clinical observation in many of America's leading small animal hospitals has amply proved the therapeutic value of this new and distinctive antiserum. ● Prepared from healthy distemper-immune dogs fully hyperimmunized against the rather fixed group of pathogens implicated in the disease complex known as infectious gastro-enteritis. ● Timely use of Gastro-Enteritis Serum Canine, Fort Dodge, when coupled with other rational measures should result in a conservative fifty per cent decrease in mortality. Being homologous, no shock follows parenteral injection even in mass doses.

$1.75 per 50 Cc vial

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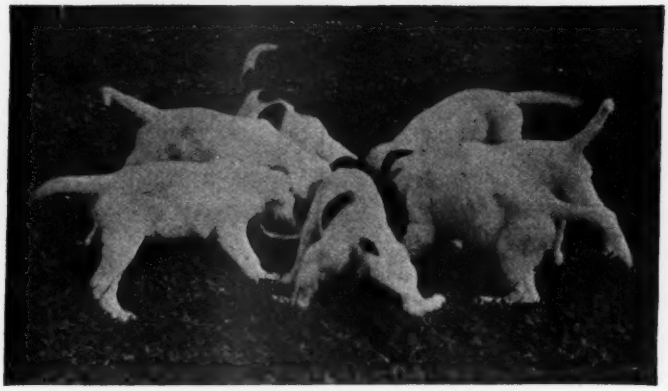

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Exactly 991 veterinarians wrote us last month, an indication of the genuine interest Formula 107-A has excited in the profession. Many of these have bought. Many have *already* sent repeat orders. Why not find out this month for yourself? No obligation. A Post Card will do.

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OAKLAND ● TORONTO

Fifty veterinary stations are combating diseases among reindeer in the Soviet Far East.

The latest Ohio farm census shows that cattle lead other livestock in both number and value, with an estimated 1,970,000 head having a valuation of $83,637,000. There were approximately 483,000 horses and colts, valued at $58,000,000 (exclusive of Ohio-owned racing thorobreds). The poultry population was estimated at 19,832,000.

A new series of advertisements in the farm and livestock press, warning farmers against fall outbreaks of hog cholera, and urging them to have their hogs immunized by a veterinarian, has been run by the Associated Serum Producers in the September and October issues of 13 farm publications with a circulation of more than three million readers.

The association's bureau, The American Foundation for Animal Health, has also issued a series of news releases to the press on the subject of hog cholera, warning farmers to have their hogs immunized before outbreaks occur.

Fourteen radio stations in leading hog-producing states have also coöperated with the Foundation in carrying brief broadcasts on their farm programs, urging watchfulness against livestock diseases and the importance of calling a veterinarian at first signs of illness.

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SMALL ANIMAL CLIPPER

The All-Year Clipper

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$19.50

OSTER takes no vacation. It is an everyday clipper. In addition to General and Plucking-Length Clipping, it offers a Surgical Shaving Service that makes it an all-year aid.

You'll be amazed at its small size, light weight, great power—the ease with which you can manipulate hair cutting operations.

Animals appreciate its smooth, quiet, and dependable performance.

JOHN OSTER MANUFACTURING COMPANY
RACINE, WISCONSIN, U. S. A.

DON'T MISS THIS BET!

INVESTIGATE THE *Vitality* DOG FOOD FRANCHISE

Many Veterinarians have materially increased their incomes by selling *Vitality Dog Foods*. The *Vitality* line of dog foods carries a money back guarantee of satisfaction. Write for complete details of our Special Offer for Veterinarians.

VITALITY MILLS, INC. DEPT. VM-11, BOARD OF TRADE BLDG., CHICAGO, ILL.

We do not manufacture remedies and we always advise dog owners to see a reliable Veterinarian for medical service

More Effective
CANINE PEDIATRICS!

KEN-L-LAC

When three weeks old, the puppy standing was given up for dead. Then he was fed Ken-L-Lac. Today he's a healthy dog!

● Ken-L-Lac, the new simulated bitch's milk, contains calories, proteins, minerals, fats, carbohydrates and vitamins especially proportioned to one another for assuring excellent nutrition. Each 14½-ounce can contains no less than 1800 Int. units vitamin A, 80 Int. units vitamin B_1, 500 Sherman-Bourquin units vitamin B_2 (G), and 300 U.S.P. units vitamin D. Each can contains no less than 7.5% protein, 8.2% fat, 2.9% carbohydrate —and no fiber. Your critical inspection of this nutritious new product is invited. Ken-L-Lac is recommended for:

- √ Raising orphan puppies
- √ Raising large litter extras
- √ Supplementing the diet of nursing bitches
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Separations.—1st Lt. Stephen Grieve Asbill, Calif., accepted appointment in Regular Army; 1st Lt. Richard Allen Goodman, Texas, died July 2, 1938.

New Assignments to Active Duty with CCC.—Capt. Fred I. Hamman; 1st Lts. Raymond V. Schoentrup, Jack O. Whitehead, Edmund B. McCormick, G. A. Morrison, Burton C. Thomson, Benjamin F. Ward, Howard F. Carroll, Milton W. Firestone, Aaron Francis Allison, Russel James Stewart, James Howard Watson.

Termination of Assignment to Active Duty with CCC.—Capts. Howard C. Gale, Hans Juergen Magens, Houston Odom; 1st Lts. Ernest L. Henkel, Walter W. Fechner, Ivan Smith, Harry Ruyle Lancaster.

gen Magens, Houston, Odom; 1st Lts. Ernest L.

Influenza, Bronchitis, Pneumonia

As the warm summer days give way to the cool and changeable weather of the fall, respiratory affections show an increasing incidence in most domestic animals. Adequate ventilation, attention to diet and hygiene, light, warm blankets and prolonged moist heat to the chest form effective measures of treatment.

Prolonged moist heat is very satisfactorily applied by means of good and comfortably hot applications of Antiphlogistine, which maintains its heat for many hours. It adds to the comfort of the patient, by promoting relief of pain and hastening resolution. Its early application may be instrumental in aborting the attack, or of ameliorating its severity.—*Adv.*.

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Horse Back To Work In Three To Five Days

It is a powerful antidote to inflammation occurring in the periosteum, articulations, bursæ, tendons, ligaments; also where there is pain, exostosis or lameness. Usually only one application is necessary. One bottle is sufficient to treat three or more cases.

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New Ft. Dodge Branch

Fort Dodge Laboratories opened a new branch at Minneapolis on September 15, with Dr. John S. Dick, Jr., in charge. The new branch is located at 1332 Marshall Street, N. E., Minneapolis. Dr. Dick, who takes charge of the Minneapolis branch, is a well known small animal practitioner and has a wide acquaintance in the veterinary profession.

Silver Anniversary Meeting

The annual meeting of the Eastern Iowa Veterinary Association will be held at the Montrose Hotel, Cedar Rapids, October 18-19, 1938. This will be the twenty-fifth anniversary meeting and an unusually good program is promised.

The hospital of Dr. Wm. Moore, Jr., on Route 1, three and one-half miles from Raleigh, North Carolina, which was opened Sunday, July 17th, was the subject of feature stories in both Raleigh newspapers on that day.

John W. Patton, East Lansing, Michigan, sailed from Montreal for Europe on September 4th, to investigate what is new in nutritional matters on the other side of the Atlantic, and the status of commercial dog foods there. Doctor Patton will return to East Lansing November 1st.

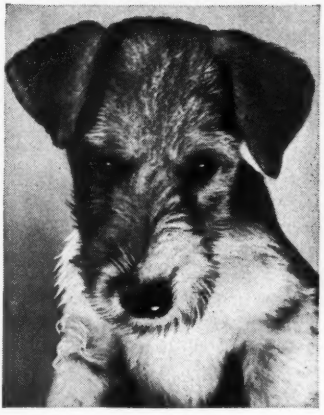
4½ YEARS OF PARD GENERATION-FEEDING TESTS ON DOGS...

And still Swift's amazing research goes on!

● PARD'S value as a complete and *scientifically balanced* dog food was first established at the Swift Experimental Laboratories on standard white rats through 3 generations (later carried through 11 generations!). But Swift Scientists held even this convincing evidence *as insufficient.* To secure unimpeachable proof, the Pard generation-feeding tests on dogs were inaugurated!

Beginning in 1934, four consecutive generations of pedigreed Cocker Spaniel, Chow Chow and Wire-haired Fox Terrier puppies have been weaned to and fed *exclusively* on Pard. Today, as Swift Scientists zealously continue their amazing research, individual health charts show an *above-normal* record in growth, lactation, reproduction, and adult maintenance for each of the 210 dogs in the test. *Not one of these dogs in the Swift Kennels has ever experienced a sick day due to dietary upsets.*

Here *is* conclusive proof of the completeness and *scientific balance* found in Pard Dog Food.



This Swift & Company product contains; Meat Food Products . . . Whole Wheat . . . Barley . . . Tomato Puree . . . Dry Skim Milk . . . Edible Bone . . . Cod Liver Oil . . . Salt.

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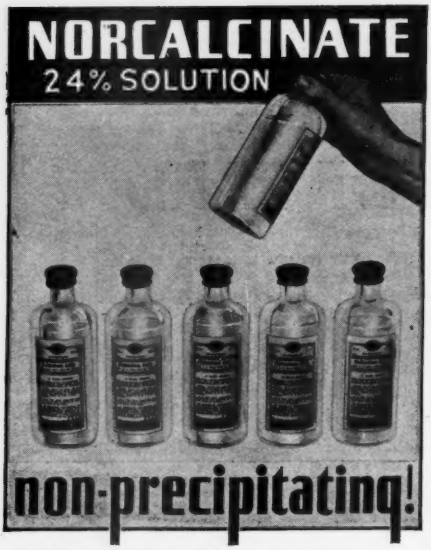

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Mid-West Small Animal Veterinary Association

The second annual clinic and meeting of the Mid-West Small Animal Veterinary Association is to be held Thursday, November 10, 1938, at Hotel Burlington, Burlington, Iowa, beginning at 10:00 A. M. There will be a dinner at 6:00 P. M., followed by a round-table discussion of ten operations and demonstrations performed during the day. C. L. McGinnis, C. N. Bramer, O. A. Anderson, Harvey Young, E. B. Ingmand, and others will appear on the clinic program.

Herbert F. Harms, a veterinarian of Pearl River, N. Y., was sentenced, Sept. 22, to 15 months in a federal penitentiary on conviction on a charge of defrauding a national bank. Veterinary supply houses will note this with satisfaction.

Clarence C. Mills, McNabb, Illinois, died August 29, 1938, after a month's illness, in the house where he was born 70 years ago. After graduating from the Chicago Veterinary College, Doctor Mills practiced for 25 years in Dixon and thereafter in Decatur, Illinois, until his retirement some years ago. He was prominent in the Quaker church and a leader in the Society of Friends.

Use this powerful, safe Antiseptic in your Practice

THE VETERINARIAN, frequently called upon to treat wounds of varying degree, will find Hexylresorcinol 'Solution S.T. 37' well suited as a general antiseptic.

In its extensive use in the field of medicine, Hexylresorcinol 'Solution S.T. 37' has been found relatively free from toxic manifestations. Because of the low surface tension of the Solution, penetration of wound surfaces is increased, causing more rapid destruction of the bacteria.

In the form of wet dressings, the veterinarian will find that Hexylresorcinol 'Solution S.T. 37' is useful in the treatment of cuts, open wounds, burns and pyogenic infections. Wet dressings should be kept well saturated with the Solution.

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So simple that any one can understand it, and at the same time it meets every legal requirement and furnishes all necessary information. No ledger required. Each client's account complete on one page. No posting necessary.

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Approximately 200 Southern veterinarians are expected to attend the next Southern States Veterinary Medical Association meeting, to be held November 3, 4, and 5, at the Andrew Johnson Hotel, Knoxville, Tenn. A two-day literary program and a one-day clinic are planned.

A delegation of German veterinarians, touring the United States, gave a dinner in Chicago, July 21st, to a number of Chicago veterinarians and Drs. H. D. Bergman of Ames and O. V. Brumley of Columbus. The visitors were: Dr. E. Ackermann, Breslau; Dr. Dietz, Frankfurt; Dr. Durchholz, Gumbinnen; Dr. Feldhus, Oldenburg; Dr. Fritz, Bladiau; Dr. Jensen, Pritzwalk; Dr. F. Koch, Gensungen; Dr. Margalowski, Heinrichswalde; Dr. Süssenbach, Wohlau; Dr. N. Wistuba, Drebkau, and Dr. W. Wittpahl, Trunz.

The visiting veterinarians expressed themselves as having experienced only one disappointment in their tour of America, that of not being shown, while at the meat packing plants, the method of preparing sausage casings. They said they were interested in all phases and details of meat inspection and that Germany is eager to import meat from the United States, provided they can be assured that the meat inspection practiced in the meat packing plants is on the same plane as that carried on at German abattoirs. They expressed the hope that future delegations from Germany might be shown the details of meat inspection denied them.

THE VETERINARY RECORD

Founded 1888

A weekly journal for the Profession.

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We hope that you will try it and convince yourself of its effectiveness.

The modern ethical ear medication . . .

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Easy to apply. Saturate on with hand—no rubbing. Doesn't burn, set skin "on fire," kill hair, or scar. Head let down in few hours. No rest necessary in many cases. Vary application to produce just degree of counter-irritation needed. Diluted with oil, makes any strength liniment desired. FREE SAMPLE—a $1.00 bottle sent free postpaid upon request if you have never had one . . . . treats several cases. It doesn't pay to be without this convenient, effective and economical preparation; write for sample or mail order today. 4-oz. size, $1.00; 16-oz., $3.00.

Detroit Veterinary Supply Co.

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Annual Public Health Meeting

The program of the scientific sessions of the 67th Annual Meeting of the American Public Health Association, which will be held in Kansas City, Mo., October 25 to 28, comprises 50 morning and afternoon meetings arranged by the 10 sections of the Association which are: Health Officers, Laboratory, Vital Statistics, Public Health Engineering, Industrial Hygiene, Food and Nutrition, Child Hygiene, Public Health Education, Public Health Nursing, Epidemiology.

Special sessions are planned on public health aspects of Medical Care, Oral Hygiene, Professional Education and Diphtheria Immunization. A public meeting under the auspices of the local committee is scheduled for Wednesday evening, October 26, with Dr. E. V. McCollum discussing Milk Pasteurization and Dr. Arthur T. McCormack on New Responsibilities of the Health Officer.

There will be symposia on industrial hygiene administration, venereal disease control, laboratory diagnostic methods, expanding responsibilities in public health engineering, maternal and child health, frozen desserts, industrial hazards, water and sewage, typhoid fever, the next steps in school health services, milk and dairy products and many other important subjects.

EQUINE INFLUENZA BIOLOGICS

Anti-Influenza Serum (Equine) and Equine Influenza Mixed Bacterin have been used for many years on horses shipped to our own biological farm, and have assisted in holding the incidence of equine influenza to a minimum. The recommended procedure is to administer by intravenous injection 100 cc. of Anti-Influenza Serum (Equine) before or at the time of shipment. After the horses have arrived at their destination, a second dose of 100 cc. of Serum should be administered, followed by three graded subcutaneous injections of Equine Influenza Mixed Bacterin (three or four days apart).

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"Abortion Test Antigen *Lederle*" is carefully standardized as to sensitivity and accuracy of interpretation on positive and negative sera.

Before distribution, each serial number is submitted to the U. S. Bureau of Animal Industry for standardization check.

The rapid plate test method using this antigen permits an added quick and reliable service to your clients, and the test may be conducted in the presence of the owner.

PACKAGES: 200 tests (20 cc. vial) 1 illuminating box, complete with electrical connections.

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An homologous, therapeutic serum of high and standardized anti-body content.

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1 dose (5cc. syringe or vial)
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WEEN is a LIQUID food made by an organization producing one of the finest infant foods available today. It is backed by more than 4½ years of biochemical research on over 500 puppies and dogs. Rich in milk protein, fats and carbohydrates and containing extra amounts of all the needed vitamins, WEEN is an ideal supplementary food for older dogs as well as a practical replacement of bitch's milk for puppies . . . May we send you more complete information?

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☆ Another new fire-proof structure (the third in two years) added to the facilities of the Pitman-Moore Biological Laboratories at Zionsville, Ind.;

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Accept our thanks for the patronage which made these enlargements possible, and necessary, and our assurance ever to keep abreast of the demand for products of proved efficiency purveyed only through professional channels.

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Army Veterinary Service

Transfers.—Lt. Col. Clifford E. Pickering, from Fort MacArthur, Calif., to Philippine Department, Feb. 28, 1939; Lt. Col. Clell B. Perkins, from Philippine Department to Fort Benning, Ga.; Lt. Col. Joseph H. Dornblaser, from South Central Remount Area, Fort Worth, Texas, to Fort Bliss, Texas, Feb. 21, 1939; Lt. Col. Irby R. Pollard, from Fort Clark, Texas, to South Central Remount Area, Fort Worth, Texas, Feb. 21, 1939; Lt. Col. Raymond Randall, from First Corps Area and from additional duty at the Boston Quartermaster Depot and at Harvard University, to Army Medical Center, Washington, D. C., Jan. 15, 1939; 1st Lt. Fred L. Herring, from Carlisle Barracks, Pa., and from temporary duty at Army Medical Center, Washington, D. C., to the medical research laboratory, Edgewood Arsenal, Md.

Appointment.—1st Lt. Robert James Brown, Veterinary Corps Reserve, as first lieutenant in the Veterinary Corps, Regular Army, with rank from Oct. 1, 1938.

Assignment.—1st Lt. Robert James Brown, to Fort Bliss, Texas.

Promotion.—To captain: Wayne D. Shipley, Oct. 22, 1938.

Retired.—Col. John A. McKinnon, Oct. 31, 1938.

Veterinary Corps Reserve

New Acceptances.—1st Lts. Louis Fink, Ralph Garcia Gomez, Chas. Frederick Helmboldt, Charles

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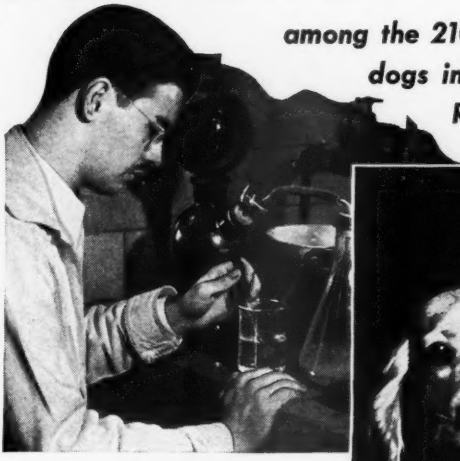
among the 210 exclusively Pard-fed dogs in Swift's Nutritional Research Kennels!



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For 4½ years Pard has been the sole nourishment of dogs in the Swift Research Kennels! Four generations—210 dogs all from popular breeds—have played a part. All have been fed exclusively on Pard in Swift's Nutritional Research Kennels. *And not one of them has ever shown the slightest symptom of eczema due to improper feeding!*

Here's a record that is significant! It proves conclusively that Pard is a complete, *scientifically balanced dog food!*

Thus veterinarians may confidently prescribe Pard to correct and to prevent dog illnesses due to hit-or-miss feeding. Pard may be counted upon to promote thrifty, vigorous growth, to maintain reproduction and lactation at normal levels.

THIS SWIFT & COMPANY PRODUCT CONTAINS: Meat Food Products . . . Whole Wheat . . . Barley . . . Tomato Puree . . . Dry Skim Milk . . . Edible Bone . . . Cod Liver Oil . . . Salt

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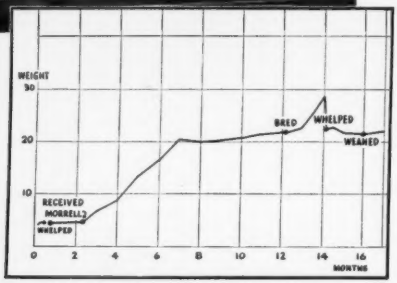
Case History

Silver Maple Ebony Lady (AKC A188,688) Thrives on Red Heart

Convincing proof of the effectiveness of the Morrell Plan of feeding is offered by the case history of Silver Maple Ebony Lady.

This splendid cocker spaniel was whelped June 22, 1937, and when received at the Morrell laboratories on August 12, 1937 weighed 4 lbs. 12 oz.



On a diet consisting entirely of Red Heart Dog Food and Red Heart Dog Biscuits, Ebony Lady increased steadily in weight (See chart above). In her tenth month she was bred. The litter of pups she whelped (shown above) was considerably above average in weight and vitality.

Important among the many benefits afforded Ebony Lady by her Red Heart Dog Food diet are (1) consistent growth, (2) reproductive capacity, and (3) lactation.

Red Heart canned Dog Food is a well-balanced formula of meat and other wholesome ingredients, including Fleischmann's Irradiated Yeast, and is a potent source of necessary vitamins and minerals.

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Stuber Miller, Elmer Darwin Moxley, Ralph Corley Watson.

Separations.—1st Lt. Robert James Brown, accepted appointment in Regular Army; 1st Lt. Warren Brown Rogers, Texas, died Sept. 30.

Promotions.—To captain: Robert Louis Anderes and Henry DeVore Smiley.

Change of Name.—1st Lt. Hyman Pogorelsky to Henry H. Parrell.

New Assignment to Active Duty with CCC.—1st Lt. Wm. R. Hulbush.

Termination of Assignment to Active Duty with CCC.—1st Lt. Robert James Brown.

The winter meeting of the Mississippi Valley Veterinary Medical Association will be held at the Galesburg Club, Galesburg, Ill., on December 16, 1938.

There are 84 veterinary practitioners in Virginia; eight veterinarians employed by the state and 41 in the employ of the Federal Bureau of Animal Industry (35 on Bang's disease eradication and six on meat inspection), according to H. C. Givens, State Veterinarian, who advocates the establishment of a veterinary college at Blacksburg as a part of the Virginia Polytechnic Institute. Doctor Givens states that there is a need for 20 additional practitioners in the state.

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September 7, 1938

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Here is the report on the use of your oral Thromboplastin, in the treatment of acute gastro-enteritis, promised you some time back. It covers 150 cases (5 cats - 145 dogs) treated during the past year.

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Our method of treatment is as follows: In cases of severe vomiting and passage of blood in the bowel movement, water was withheld for several hours, followed by a ten to twenty c.c. dose of oral Thromboplastin diluted with an equal amount of water. If the first dose is vomited, it is repeated in thirty minutes. The same dose is repeated in four to six hours, and followed in four hours with one to three teaspoonfuls of bismuth subcarbonate diluted with water. The bismuth is repeated every four hours as long as necessary.

When blood still appears in the stools after 24 hours, all food is withheld and dextrose is given intravenously along with intraperitoneal administration of normal saline solution. The use of Thromboplastin is continued as long as there is any evidence of blood being eliminated. Complete rest and confinement are essential.

We have had almost 100% recoveries except where intussusception or rupture of the intestine occurred. In the greater number of cases blood was completely absent in 24 hours after treatment was started and the diarrhea completely checked in 72 hours.

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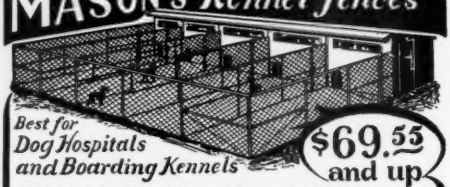

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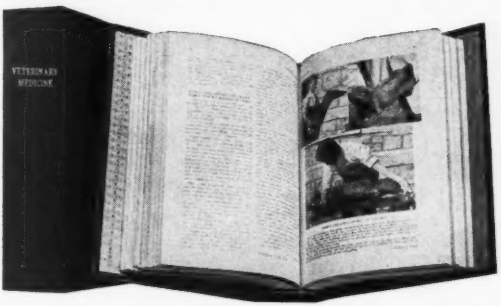

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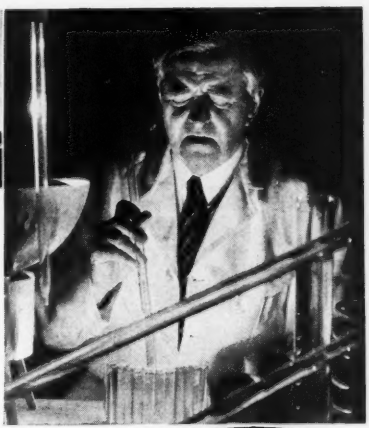

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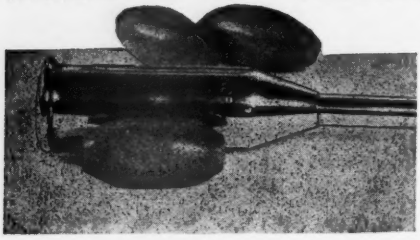

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Martin to Head Regional Poultry Research

The appointment of Dr. J. Holmes Martin, professor of poultry husbandry and genetics of the University of Kentucky, as director of the new Regional Poultry Research Laboratory at East Lansing, Michigan, has been announced by Dr. John R. Mohler, Chief of the B.A.I.

Doctor Martin, who for 21 years has served on the staff of the University of Kentucky, is a graduate of Purdue University, holds a master's degree from the University of Kentucky and a doctor's degree from the University of Wisconsin. He is the author of numerous scientific papers and publications in the field of poultry husbandry, was for several years editor of Poultry Science, the official publication of the American Poultry Science Association, and has served on numerous nation-wide committees of the industry.

In his position at East Lansing Doctor Martin will direct the work of the new Poultry Research Laboratory and coordinate its research activities with those of the 25 North Central and North Eastern State Agricultural experiment stations cooperating in the attack on problems affecting the viability of poultry.

It is anticipated that the construction program now under way at the new laboratory will be complete enough by January 1, 1939, to enable research workers to initiate their research program.

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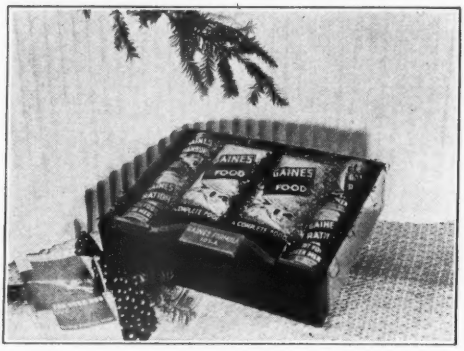

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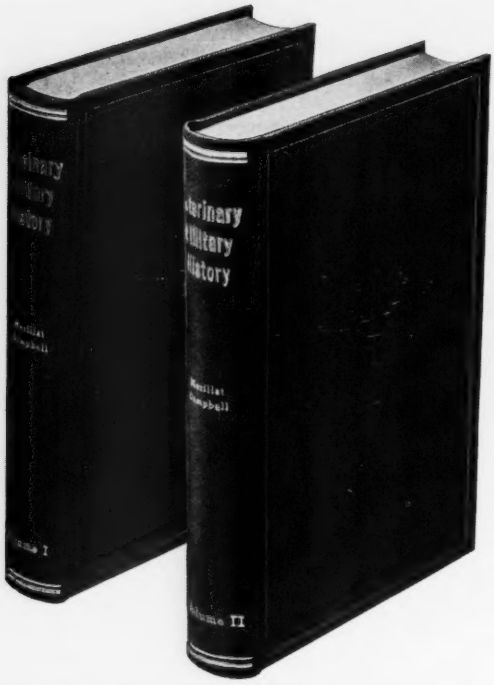

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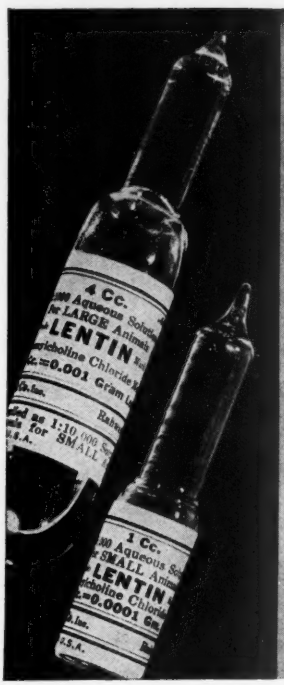

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Young Veterinarian Dies

Dr. Clifford Philemon Murry, 26, of Glens Falls, N. Y., the son of the late Dr. H. Clifford Murry, died October 6, 1938, as the result of an accidental shooting during target practice. Doctor Murry, who was graduated from the New York State Veterinary College at Cornell in June, 1934, had taken over his father's practice, established in 1910, and was operating it successfully at the time of his death.

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Horse and Mule Numbers Continue Downward Trend

The downward trend in horse and mule numbers on farms in the United States probably will continue for several years, according to the Bureau of Agricultural Economics.

Its annual report on the outlook for horses and mules points out that the 832,000 horse and mule colts in 1937 was about 400,000 head short of the number of work animals disappearing that year. "Even with expected increases in colt crops and smaller disappearance," the report said, "it still will be several years before the decline in work animal numbers will be checked."

Major changes in the farm power situation are attributed to various events of the past several years. The droughts of 1934 and 1936 forced the sale of horses and mules in some areas. Encephalomyelitis and old age increased the death rate of workstock. And farm labor has become more "mechanically minded" as many farm operations have shifted to tractor power.

The result has been a decrease in the amount of farm work done by workstock and an increase in the amount done by tractors. The rapidity with which this shift continues and the time when it will be halted, the Bureau points out, will depend upon the relative prices of work animals and tractors and of feed grain and tractor fuel, upon the

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farm labor situation resulting from changing economic conditions upon further improvement in tractors, *and upon the development of disease control.*

Horse and mule prices reached the highest point in 17 years during 1937, but during the latter part of 1937 and well into 1938, prices dropped 10 to 15% below those of the previous year. But compared with prices of all farm products, prices of horses and mules were higher during the first eight months of 1938 than in any other period since 1916. This price relationship is expected to encourage colt production during the next year or two.

Deaths of Veterinarians

Wm. M. Kinney, 71, Wooster, O., Mar. 12; C. E. Canaan, 68, Anthony, Kans., May 6, M. J. Jones, 56, Harrisburg, O., May 7; G. W. Wilson, 70, Honey Grove, Tex., May 22; L. N. Larson, 63, Whitehall, Wis., May 28; Fred T. Cates, 58, Clio, Mich., May 29; J. K. Woods, 50, Warrensburg, Mo., June 3; Verne C. Stutson, 60, Winthrop, Ia., June 5; Fred M. Hayes, Davis, Calif., June 12; H. C. Becker, 76, Chicago, Ill., June 10; E. W. Little, Amarillo, Tex., June 17; F. M. Hopper, 54, Bruceton, Tenn., June 18; J. P. Hart, 61, Winchester, Ind., June 25; R. A. Goodman, 32, Wichita Falls, Tex., July 2; J. J. Graham, 50, Germantown, Pa., July 3; A. O. Bernhardt, 43, Platteville, Wis., July 5; F. M. Blatchford, 66, Brighton, Mich., July 9; L. H. Adams, 53, Middlesex, Vt., July 14; R. V. Smith, 68, Frederick, Mo., July 19; F. B. Rowan, 84, Rockford, Ill., July 24; W. J. Hennessey, 65, Worcester, Mass., July 30; J. A. Flynn, 47, Jessup, Ia., Aug. 6; S. E. Hoge, 48, Varna, Ill., Aug. 14; J. W. Beckwith, 64, Shullsberg, Wis., Aug. 15; A. H. Hollenbrink, 49, St. Joseph, Mo., Aug. 17; D. F. Richardson, Hoopeston, Ill., Aug. 20; E. V. Robnett, 70, Oklahoma City, Okla., Aug. 26; C. C. Mills, 69, McNabb, Ill., Aug. 29; Capt. R. S. Hunsberger, 27, Camp Perry, Ohio, Sept. 4; A. T. Peters, 70, Peoria, Ill., Sept. 11; W. A. Harron, Homewood, Man., Canada, Sept. 15; F. L. Tritle, 62, Kansas City, Mo.; W. S. Hewitt, 86, Kingwood, N. J., July 13; U. G. Fridirici, 72, Temaqua, Pa., July 18; J. C. Heide, Sr., 79, Washington, D. C., July 20; W. G. Jennings, 65, Plymouth, Mich., July 21; W. M. Cotton, 86, Victor, N. Y., Aug. 8; B. L. Griffin, 71, Concord, N. H., Aug. 18; R. E. Davis, 64, Toledo, O., Aug. 19; Hamilton Gutmann, Somerville, N. J., Sept. 1; Robert Elmore, Chelan, Wash., Sept. 2; T. W. Crump, 52, Flagstaff, Ariz., Sept. 8; Robert McGowan, Jr., 55, East Orange, N. J., Sept. 12; G. C. Hill, 78, Oshkosh, Wis., Sept. 14; J. D. Adams, 65, Boise, Idaho, Sept. 21; J. J. Findlay, 78, Duluth, Minn., Sept. 23; O. M. Goodale, Kewanee, Ill., Sept. 27; A. H. Horne, 41, Warrensburg, Ill., Sept. 28; Sherman Burdick, 80, Otego, N. Y., Oct. 1; C. S. Chase, 70, Bay Shore, L. I., Oct. 1; F. H. Guldager, San Francisco, Calif.; K. J. Moye, 47, Cabool, Mo.

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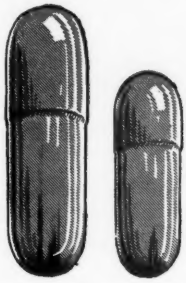

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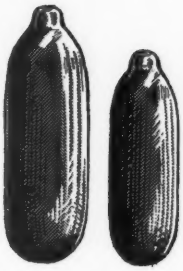

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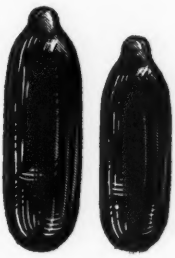

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